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Photo: S. B. Bolas and Co.

EXETER CATHEDRAL. CORBEL AT SOUTH-EAST ANGLE OF CROSSING.

HEAD OF A LAY MASTER, POSSIBLY THE ARCHITECT.

How Exeter Cathedral was Built–II.*

III.—The Norman Church.

The history of Exeter Cathedral has been less fully unravelled than has been the case with many others. Dr. Oliver, in a valuable survey made before Scott's restoration, printed some interesting extracts from the Fabric Rolls, but his reading of the building itself was not satisfactory.*

Canon P. Freeman's careful examination of the Fabric, taken together with his citation of the documents, is the best authority we have. Professor E. Freeman, in his history of Exeter, published in 1886, quite ignored his namesake's work, published a dozen years before, and fell back on Oliver; and still more recent accounts seem to have been compiled by jumbling the two incommensurables together. It is a pity, in regard to Exeter, that we have not had the advantage of such an analysis as Professor Willis made of the development of Canterbury and Winchester.

* "Lives of the Bishops of Exeter," etc., etc

The great singularity of this cathedral is to be found in the two massive Norman towers which stand on either side of the body, or, if I may be allowed to use the better French word, of the Vessel, at the half-length. These are said to have been the work of Bishop Warelwast, 1107–36;† but the fineness of the ashlar masonry and the advanced detail would almost suggest work wrought in the second half of the twelfth century. The South Tower is entirely Norman, including the four crowning turrets and their corbel tables (Fig. 3), but the upper storey of the North Tower was built, or rebuilt, in 1478–86, together with the pointed leaded roof which is shown in King's etching for Dugdale. This leaded spire balanced a pyramidal leaded roof about 55 feet high, which from the first seems to have surmounted the South Tower. Weatherings above the slope of this leaded spire are, or were, to be found on the inner angles of the four Norman turrets which stand well in over the angles and allow the passage-ways to pass through them and the spire to spring from them. That from the first these towers formed transepts opening from the interior is shown by the comparatively large windows, one of which is to be seen in the west face of the North Tower, while a second in the same, and two others in the South Tower may be traced.

Photo: E. Dockree.

FIG. I.—NORTH TRANSEPTAL TOWER.

During the works carried out by Scott, evidence was found which shows that the walls of the nave aisles are still in part Norman for their entire length. At successive points along the aisles, especially on the south side, signs are to be seen that early pier-responds have been cut away, and the base of one of these was found *in situ* under the present wall-seat. These show that the piers of the nave arcade were about 18 ft. 6 in. apart from centre to centre. (See Trans. Ex. Dioc. Archl. Soc., N. Series, Vol. V., p. 120.) The later pier-responds are evidently cut into an older wall,

* Continued from the March issue.

† A fifteenth-century chronicle quoted by Freeman. The character of the masonry of the North Tower has been much falsified by that abomination wide tuck pointing.

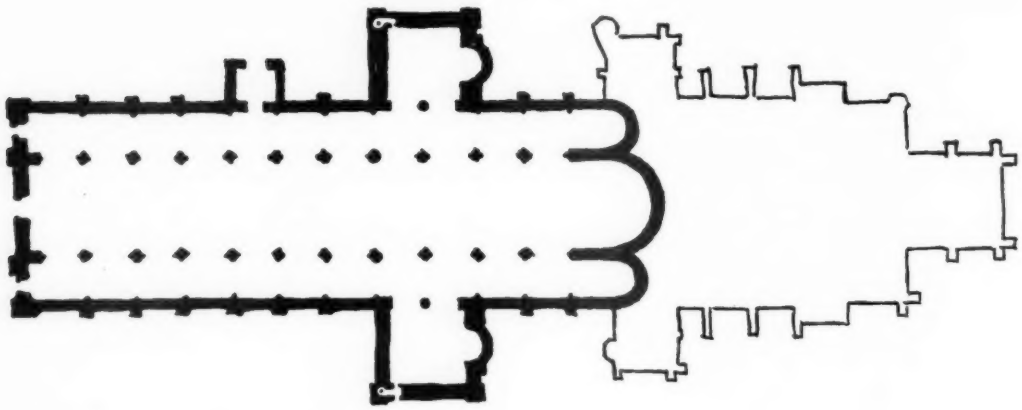


FIG. 2.—PLAN OF NORMAN CHURCH.

and even the early thirteenth-century door to the cloister is also an insertion, while a part of the west wall is almost certainly Norman work.

On the exterior the evidence is still clearer. On the south it may be seen how the nave-walling ranges with the masonry of the tower, and on the north we have not only a Norman plinth in continuation with that of the tower, but the lower parts of the flat Norman buttresses of the aisle-wall are preserved. These buttresses, which project 9 inches, were 4 feet wide, and the interspaces were about 14 feet 6 inches, which again gives us 18½ feet for the dimensions of the bays.

In the eastern limb of the church there is a decided break in the work after the third bay from the crossing. Up to this point the fourteenth-century marble columns are 8 or 9 inches bigger than those beyond, and differences may be seen in the arches and other details. Further, on the inside of the nave-walls, just above the wall-seat, a chamfered plinth is to be seen which is plainly part of the Norman work; a similar plinth may be traced along the south aisle of choir for three bays. An article written on the discoveries made while Scott's work was in progress, contributed to the *Saturday Review*, says: "It is now known that the Norman cathedral ended eastward in a triple apse, since the foundations of one of the three divisions were discovered in the north aisle, at the end of the third bay from the west. . . . . The western bays are, in fact, the old Norman walls transformed."* There were probably also small apsidal chapels opening from the transept towers where there are now square chapels. These towers must always have had altars from whence their names of St. Paul's Tower (north) and St. John's Tower (south) are derived. In the Fabric Roll of the year 1280 we are told of alterations to "St. John's Tower," and in 1285 there are entries for similar work in "St. Paul's Tower," and for removing "St. Paul's altar." In 1287 "St. John's altar" was also moved into the enlarged chapel opening from the tower (Freeman, p. 73). We can even carry back the altar of St. John a century further, for about 1235 Bishop Bruere gave a portion of his garden "juxta turrem Sct. Johannis" for a new Chapter House; and Bishop John, who died in 1191, was buried in the South Tower (evidently before the altar of his name saint), "where his tomb remains undisturbed."*

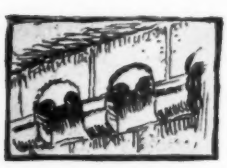


FIG. 3.—CORBEL-TABLE TURRETS, SOUTH TOWER.

* See "Exeter Cathedral and its Restoration," T. B. Worth, 1878.

If we consider the original spacing of the bays of the nave, of which, as we have seen, clear evidence remains in place, we find that each tower with its thick walls occupies the space of two bays. As the old choir doubtless ran on westward of the towers,† the great arcade would almost certainly have been continuous, and it is probable that the towers at first opened from the aisles with a pair of arches,

* Oliver: a document of 1409 speaks of this tomb of Bp. John in St. John's Tower (in Lyttleton): Leland says the same.

† Freeman.

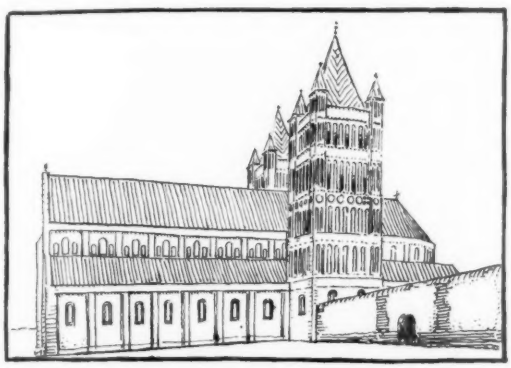


FIG. 4.—SOUTH VIEW OF NORMAN CHURCH.

and that the great alteration of c. 1280 consisted in throwing these into one and heightening the opening in each case.

We are not left without some indications of the treatment of the church in detail. The remnants of the pier-responds along the nave show that they were accurately built with alternate courses of bright red and white stone, the red stone bonding on each side of the responds (of 2 feet wide) in an exactly symmetrical manner. Here we have another instance of the counter-changing of two varieties of stone, of which the Chapter House of Worcester is such a remarkable example, and which is also found at Chichester and other places.

Even for the height indications might probably be found on the inner faces of the towers as seen in the roof-spaces of the heightened church. (Since writing the above I find that Britton states "That the roof of the new church was raised considerably higher than that of the old one is evident from the ancient Norman windows and other ornamental work which may be seen on each tower between the present vaulting and the roof.")*

The windows of the church, we may suppose, were generally like those which remain to us in the towers. Altogether, the Norman church, with its companion towers and leaded spires, standing high above the nave and choir, furnishes a distinct type in the history of English architecture.

IV.—The Lady Chapel and the New Work.

According to tradition, Bishop Marshall (1194–1206) finished the church after the "plat and foundation" of his predecessors. On the south side of the nave (exterior) are Early English consecration crosses, which may witness to the dedication of the nave altars at this time.*

A Lady Chapel is mentioned in a document of 1237, which provides for certain masses in the chapel of the Virgin. Oliver concluded that this was the present Lady Chapel; and Canon Freeman supposed further that a large eastern extension was made to the church at the same early date to connect the chapel with the old work, and he assigns to Marshall the "longer choir (presbytery), Lady Chapel, and six other chapels, north porch," &c. That is, as he follows it in detail, the entire ground plan as it exists to-day. Moreover, he says that the whole was vaulted only four or five feet lower than at present; and even the towers were opened up "partially" with pointed arches. Further, he supposes that Branscombe (1257–80) made a first recasting of the Lady Chapel and its two side chapels. Then came Quivil (1280–91), who "designed the decorated cathedral, and transformed the transepts, east bay of nave, Lady and adjacent chapels, and retro-choir." That is, according to this theory, leaving the Norman choir and Marshall's supposed Presbytery as an island to be dealt with by Bitton (1292–1307), Quivil transformed the work round about, and made a specimen bay of his new design in the nave.

The evidence submitted for the extensive work assigned to Marshall ought to be overwhelming, in face of the improbability that here, at Exeter, we should get, at the end of the twelfth century, the same fully-developed plan as at Salisbury, and that such a great work was superseded *on the same lines* from 1280 to 1310. Canon Freeman's sug-

* It would be very interesting to have careful drawings of these parts.

* The chapter house was built by Bruere (1224–44). The large door in south wall of nave was probably also his work, and inserted in the Norman wall to give access to the chapter house.

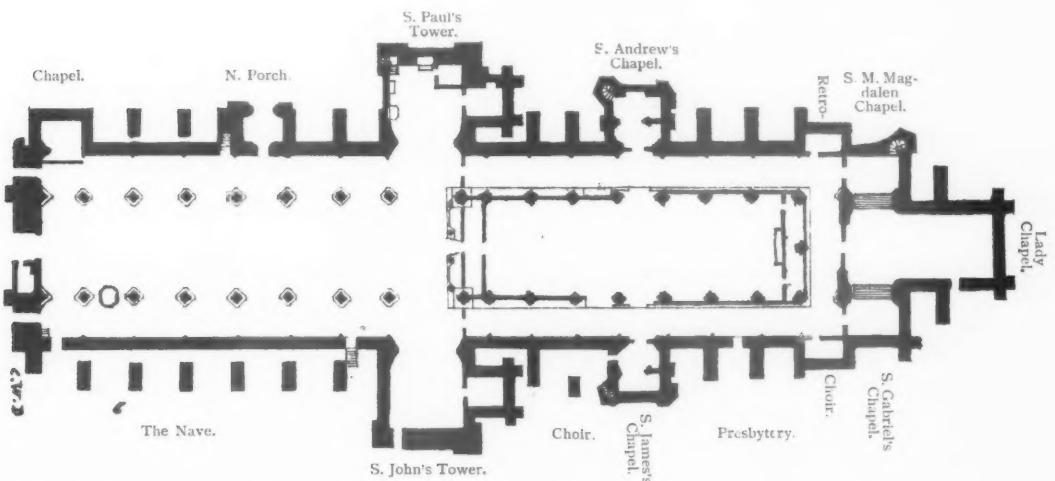


FIG. 5.—EXETER CATHEDRAL. PLAN.

gested proofs from the structure all seem to me to fail, and the allusion to a "Chapel of the Blessed Virgin," in 1237, does not necessarily imply the early existence of the present eastern Lady Chapel. The strongest point in favour of such a large eastern extension at an early time is a deed of Branscombe's (1280) endowing St. Gabriel's Chapel, where he had chosen his place of burial, "in the chapel almost anew constructed (*de novo constructa*) by the Chapel of St. Mary on the south side," which Freeman reads: "in the almost reconstructed chapel." Further evidence seems to be required before we should accept the Marshall theory as proved.*

The place assigned to Quivil by Freeman, is that he "designed" the *transformation* of the Norman and Transition church into a decorated one. It is certain that work done in his day (which included the finishing of the remodelling of the transepts), deeply impressed his contemporaries and successors. The witness of the stones themselves, however, taken together with the documents, is final as against the great claims to initiation set up for Quivil.†

The existing Fabric Rolls show that an important "work" was already in hand on Quivil's accession; the first of the rolls now in existence being of Branscombe's last year. We have no knowledge of how many are lost, but it is certain that a work and the rolls of accounts are complementary to one another, and that the series of rolls dates from Branscombe's time. Again, when we find that already in 1280, in the latter half of which year Branscombe died (July 22), the alterations to the transeptal towers were in full course, we are driven to carry back the origin of even that part of the work still earlier. Provision for such a work could not have been made in the first two or three months of Quivil's rule.

The deed of Branscombe's, before referred to, shows that the Chapel of St. Gabriel, next the Lady Chapel, was in July, 1280, nearly completed. Again, Freeman himself, speaking of the Chapels of St. James and St. Andrew opening from the choir aisles, says, in an aside out of the line of his main argument for Quivil, that "Branscombe, toward the end of his time, began to transform these chapels into their present state—just as he had, a little before, reconstructed the Gabriel and Magdalen Chapels. For the very first entry in our Fabric Rolls is for three windows for St. James' Chapel, September, 1279. It is most probable that the St. Andrew's Chapel was in part transformed at the same time."

I object here to the idea of a mere re-editing of old chapels, but it is certain, in any case, that the windows of the present south chapel were being wrought nearly a year before Branscombe's death, and that St. Gabriel's Chapel (St. Gabriel was this bishop's special patron) was at the same time being built for the place of his tomb, and that the Lady Chapel in its present situation by St. Gabriel's was spoken of as in being, although possibly only rising from the ground, like its flanking chapels.

If we now turn to the building itself we find that the lower part of the Lady Chapel, with its companion chapels and the retro-choir, certainly form part of one effort, and are of earlier date than the rest of the work. In the *sedilia* of the Lady Chapel we have the only example to be found in the church of the trefoil foliage typical of Early English, and it is associated with naturalistic leafage in a way that could only be found in work wrought not later than the first years of Edward I.

If the five chapels of the eastern limb of the church were well advanced by Branscombe before his death, and even the remodelling of the transepts was in progress in the first months of Quivil's reign, it is evident that the whole scheme for recasting the eastern end must have been already settled, and the "design" of the present church must be credited to Branscombe and not to Quivil.*

Everything shows that Branscombe was a great organiser and man of affairs, and his rule extended to twenty-three years, as against Quivil's eleven. He instituted the Diocesan Register, which shows that in 1259 no less than forty new or enlarged churches were consecrated in his diocese. He gave liberally to the building of Newnham Priory and Bodmin Friary. He restored the establishment at Crediton, founded the College of Glaseney, and built the bishop's house at Clyst. He collected the constitutions of the cathedral body, and instituted a celebration of St. Gabriel, with the annual feeding of 500 poor. Even his own magnificent effigy was probably wrought before his death, and seems to speak of a dominant and ambitious character.

It fell to Quivil not only to continue the work in hand on his accession, and to carry the eastern chapels on to completion, but we must allow him the chief part in the next block of work undertaken, that is to say, the Presbytery immediately west of the retro choir. The Presbytery and the choir seem in the Fabric Rolls to be specially

* Freeman supposes that the buttresses of choir and Lady Chapel, the corbel table of the latter, and the internal piers between it and the side chapels, belong to Marshall's time: the windows of Retro-choir he dates about 1230, and says they resemble those of the Choir of Westminster, "c. 1230"—a mistake in itself, as this should be c. 1250—and the Exeter windows show a considerable advance on Westminster.

† He appears to have made generous gifts to the Fabric, and this may be the reason of his reputation.

* Even St. Edmund's Chapel, at the north-west end of the nave, seems to be as early as the other chapels.

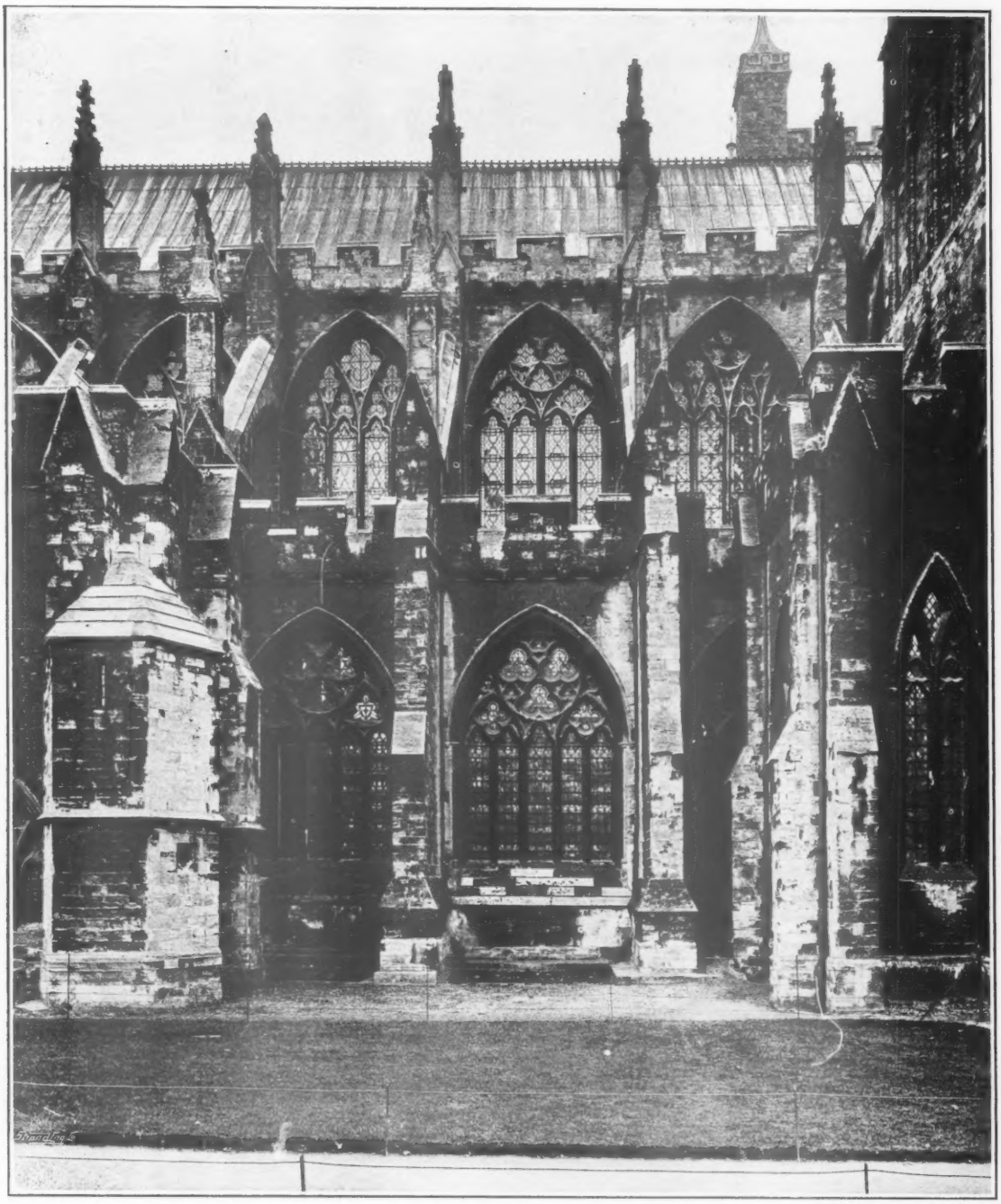


FIG. 6.—EXTERIOR OF THE CHOIR FROM THE NORTH. *Photo: S. B. Bolas and Co.*

called the "New Work"; and the Fabric Roll for 1308 speaks of Quivil as first founder of the new work (*primus fundator novi operis*). Eight years after his death the Presbytery was ready for its roof, and in two years more (1301) was completed even to some of the glazing. If we consider the long preparation required for such a work, including the great marble pillars from Corfe, we are surely forced to assign to him the chief glory of the Presbytery. In his Obit he is said to have "enlarged the church in respect to the new work therein," and that he did it largely at his own expense. He was buried in the centre of the still hardly completed Lady Chapel, and was celebrated first amongst its benefactors. Freeman supposes that his enlargement of the church by the new work refers merely to the remodelling of the transept towers, but I think

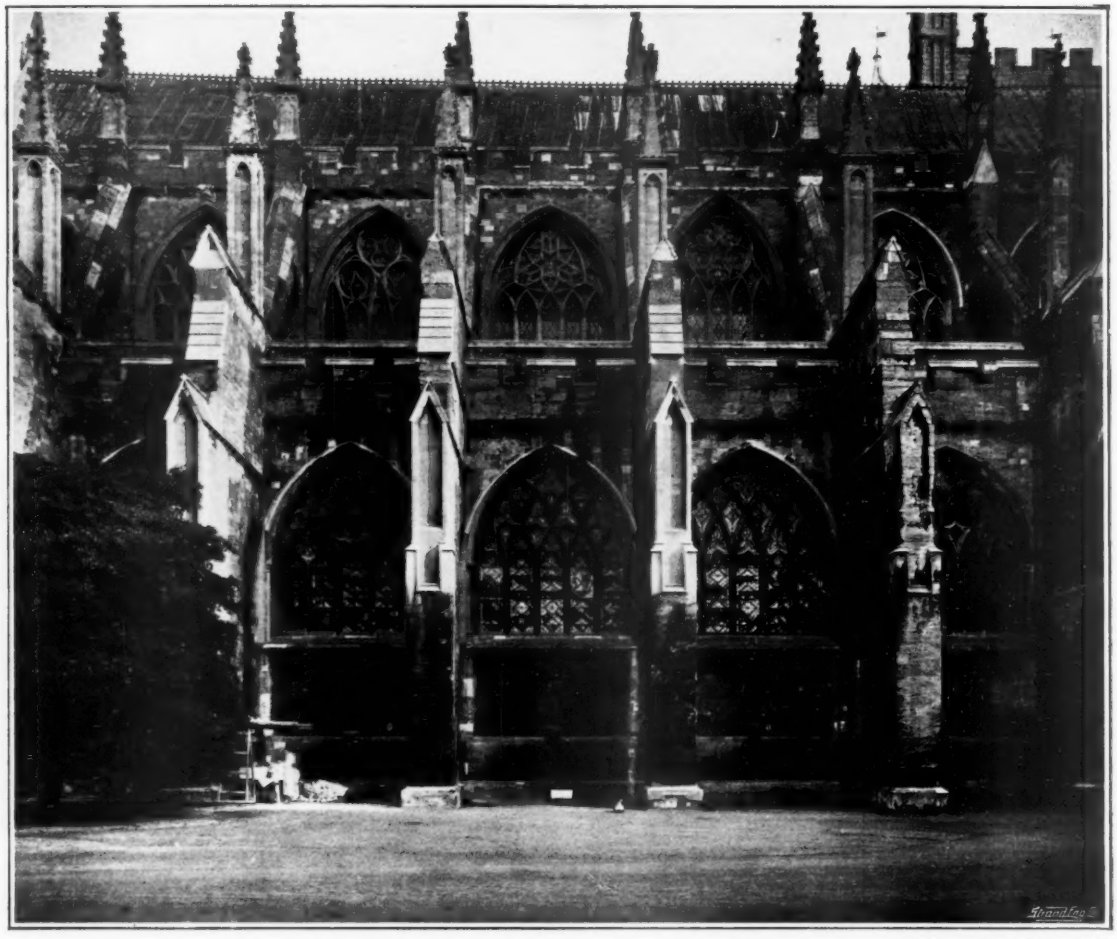


FIG. 7.—EXTERIOR OF NAVE FROM THE SOUTH. INDICATIONS OF TEN COUPLED BAYS OF THE CLOISTER MAY BE SEEN ON THE AISLE WALL.

Photo: S. B. Bolas and Co.

further consideration of the extracts he gives shows conclusively that the Presbytery was his; and the phrase "first founder of the new work" is an argument against Marshall's supposed prior extension.

Bitton, who was to complete Quivil's work, succeeded in 1292. Under him in 1301 the vaults of the eastern chapels were painted with gold, silver, azure, and other colours.* In the same year the glazing of the east gable of the new work was in progress (*frontis novi operis*) and this, as Freeman says, undoubtedly refers to the east window of the Presbytery. In 1303 Thomas the Plumber was at work *super capellam B. M., et alibi super novum opus*. Here it plainly appears, as Lyttleton has already remarked, that the New Work is distinct from the Lady Chapel.

Again in 1303 we have an entry for setting the glass in the upper gable, in the eight upper windows (clerestory), and the six aisle windows of the New Work. The glazier was Master Walter le Verrouer, and the moment speaks of the structural completion of the Presbytery.

The second division of the new work, the choir proper, seems to have followed the first, six or eight years later (Fig. 6). In 1310 Master Walter le Verrouer was setting the glass, and in the previous September the stalls were moved into their place in the new choir. There is a marked difference in the carving of these two sections; and in the eastern, or first executed, bays, there was at first no triforium, which was only cut in by Stapledon in 1318 to range with that in the choir, which had it from the first. Bitton died in 1307,

* This seems to be the moment of the completion of the Lady Chapel. Its beautiful reredos agrees with this date. "The centre niche is the only original one remaining; the others on either side are of somewhat similar design but have been badly restored. They do not join the centre one as they must have done originally, as the modern pinnacle is stuck against the ancient one, and conceals a portion of the crockets and springing of the small canopies. The whole of the centre niche has been richly painted and gilded, but when the new work was added the old was covered with yellow wash. The modern work is, probably, a rough imitation of the original."—*See* Collings' *Gothic Ornaments*, 1850.

and was buried in the midst of the new work before the high altar. We may assign to him the structure of the choir, which he must have seen nearly completed before his death.

Examination of the fabric demonstrates, I think, that the crossing and the first bay of the nave, form part of one work with the choir, the carving throughout having closer affinity with the nave than with the Presbytery. The first bay of the nave did not receive its glazing until 1317 and 1318; along with other windows about the crossing and in St. Edmund's Chapel at the north-west angle of the nave. This bay we may perhaps assign to Stapledon (1308–1326); he, however, was for the most part engaged in finishing and furnishing the works of his predecessors. Much of the glazing, the bishop's throne, the sedilia, the altar and high canopied reredos, and the pulpitum, all were provided before his death. He was buried to the left of the high altar, and Grandisson, his successor, in 1328 dedicated the new work.

Grandisson, in his turn, took up what he called "the half-finished church," but it seems almost certain that the work of the nave must have been well in hand in Stapledon's last year when he bought fifteen great poplar trees for scaffolds; and it appears from the rolls that this year was one of the two points of maximum expenditure in the course of the works. The other was in 1310 when the choir was being completed. As early as 1328 work was going forward at the west front, and in 1332 William Canon reckoned with the Dean and Chapter for marble found by himself and his father for the fabric of the nave, and received at this time a small balance of £7. 8s. He also bound himself to do any repairs found necessary at the time of fixing. This he fulfilled and received 54s. (which had been disputed) in final settlement, September 9th, 1334. The details show, as Freeman has pointed out, that this reckoning included all the marble work of the nave except the east bay, which had been done before, and comprised the triforium as well as the great columns. The design and origin of the new nave must, it seems from this, be pushed back into Stapledon's time. In 1338 Grandisson wrote an order for twelve oaks, and these, no doubt, were for the roof, as Freeman supposes.

In 1341 £190 was spent; in 1342 £144, but after this there is a sudden drop to an average of

Photo: S. B. Bolas and Co

FIG. 8.—INTERIOR OF THE NAVE FROM THE CLERESTORY.

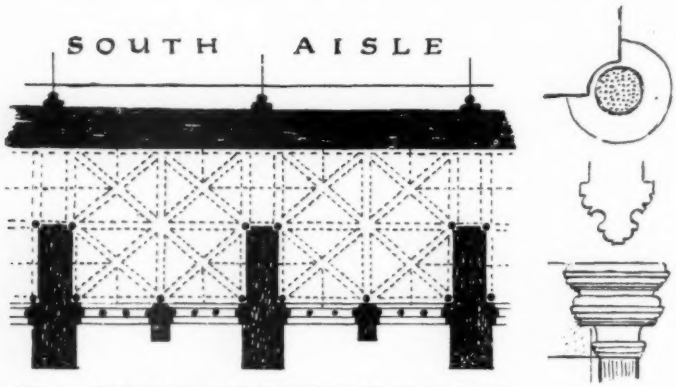


FIG. 9.—RESTORATION OF NORTH WALK OF CLOISTER.

about £40 as the work of the nave drew toward a close. There was not, I suppose, any cessation in the progress of the works from the time when Branscombe began at the east end, let us say about 1270. As soon as the masons were taken off one part they were probably set about the next, in a clearly defined general scheme. Thus the beginning of the nave would date from the completion of the crossing and first bay. The average annual expenditure seems to have been about £200. For seventy-five years this would amount to £15,000, and this sum, about £300,000 of our money, we may put as the cost of Exeter Cathedral. Amongst the last items of expense was the bringing of water to the close, and the erection of St. Peter's fountain in 1346–48. This was a conduit near the N.W. angle of the nave; it is shown on the old coloured plot of the close. Even a wall which enclosed a yard on the N. side of the nave, now destroyed, belonged, I suppose, to this time; it had a fine coping, and the yard probably formed the plumbery.

In 1353 a new work was begun "in front of the great cross," the expenses of which were altogether £46—this, Freeman supposes, is the Minstrels' Gallery.*

The north walk of the cloister attached to the nave appears to have been built along with the nave buttresses which form an integral part of it. Marble for it is mentioned in Canon's bill for 1332.

The form of this north walk can be easily conjectured from the fragments which remain, although it is to be hoped that no one will want to "restore" it (Fig. 9). The trivial game of restoration is surely now played out. This cloister formed a series of alcoves between the buttresses. From fragments which were found in 1817, it appears that the bosses, vaulting, and tracery had been richly gilt and painted, and that there had been large windows between the buttresses.* A south walk, and probably one to the west, were added about 1370–80; the windows were glazed. There is some doubt as to an east walk, and in the "scientific restoration" now begun of this thing, for the previous existence of which there is no proof, a great buttress of the chapter house has been cut away to make room for it. The other, too, will vanish, I suppose, when money is forthcoming for this whim. The expenditure shown in the fabric accounts rises again at the building of this cloister, and its erection seems to have formed a separate work (*opus claustrale*). The accounts rise again in 1390, the year when the new east window was inserted.

On one other last point I have to differ from Freeman's valuable book, which sets out its *facts* so accurately that they can often be used against his conclusions. He assigns to Bishop Oldham (1504–19) not only the three late chantries, but also the graceful screens to the three eastern chapels; now those before the chapels of St. Gabriel and St. M. Magdalen, bear illuminated on the jambs of their doorways, faded but certain, the Arms of Stafford (1395–1419)—or, a chevron gules, on a bordure azure eight mitres or. These screens were probably erected in 1410 when Stafford invited subscriptions for the fabric. The wood doors in these screens are very well painted in an early style, those of the north chapel with flourishes of white on a vermilion ground, and those to the chapel of St. Gabriel with a beautiful Annunciation, Gabriel bearing a scroll inscribed *Ave Maria plena gratia.*

V.—The Architects and other Artists.

As we have seen, Exeter Cathedral, as it stands to-day in its seeming unity and exquisite "proportions," was no exercise in original design, but is the result of recasting a pre-existing church by making an extension eastward, retaining the old towers and rebuilding the nave on the old lines. According to our point of view such a work is either a compromise and a cobble, or a thing superpersonal, a unity whose day was three centuries.

This process of building was conducted by a series of head-masons, carpenters, plumbers, and glaziers, who were engaged and "sworn" as occasion required, to carry on the work at fixed wages. We have in the Fabric Rolls of Exeter a series of accounts for the building done from 1279 to 1440. There are upwards of a hundred tight little rolls

* For the fine collection of musical instruments figured here see Carl Engel's "Musical Instruments." They comprise the Ciffern, Bagpipe, Clarion, Rebec, Psaltery, Syrinx, Sackbut, Regals, Gittern, Shalm, Timbrel, Cymbals.

* *See* Britton.

of parchment, about nine inches wide and two to five yards long. I have looked over one or two of these, not, it is true, at sufficient leisure to add to what has been extracted by Oliver and Freeman, but a glance shows the precision with which the names and wages of the masons and other artists were set out week by week. And it is certain that a day or two of labour would make plain that a great deal of the work could be assigned to the individual workman who wrought it. These Rolls, as a series, are, however, incomplete, especially it would seem at the beginning.

In the practice of Mediæval building, as each considerable effort was made, what was called a "New Work" was constituted, together with a special fund and responsible heads, who were called "keepers of the work." The Rolls show that here at Exeter, exactly as at Westminster Abbey, building was carried on under the joint charge of a master of accounts and a master of masonry.* Dr. Oliver has printed in full a roll for 1299, an important moment when the beautiful work of the Presbytery was nearing its completion. In it the wages of each man is set out for every week in the year; it is headed "Compotus Domini Roberti de Asperton et Magistri Rogeri Cementarii, custodum novi operis." Nine or ten other masons are mentioned besides Master Roger; five received 2*s.* 2*d.* a week, the others less. Richard de la Streme, evidently the foreman, heads the list with 2*s.* 3*d.* At the end of every quarter is entered, "In Stipendio Magistri Rogeri Cementarii, pro termino, 30*s.* Et Domini Roberti de Asperton, 12*s.* 6*d.*" The latter in one place is called Vicar, so that we may know that he was one of the clergy. Cementarius is, of course, "Mason"; the latter word came more into use in the fourteenth century. The wages of Architect Roger were thus just under 2*s.* 6*d.* a week. Master Walter, the carpenter, at the same time, received 2*s.* 3*d.* a week. This Master Walter appears together with a sudden addition to the staff of carpenters in the third quarter of this year, 1299, and his advent probably marks the moment of beginning the roofs of the Presbytery. Four years later we hear of three shillings paid to Roger, the mason, for going to Corfe to buy stones. We may almost certainly assign to him the vault of the Lady Chapel, the upper part of the Presbytery, and the beginning of the choir. Possibly he was architect of the Presbytery from the first. William de Montacute was working as a sculptor at this time. Freeman says that he executed carved doors for the choir in 1302, and brackets and bosses in 1313. But with our usual English eagerness to give away English art, he adds that William de Montacute was a Frenchman. Now Montacute is close to the Ham Hill Quarries only about thirty miles away in Somersetshire. We may associate him more exactly with the bosses of the high vault which were wrought 1303–4; they cost 5*s.* each.* Under the Corbel at the S.E. angle of the crossing is carved the head of a layman in a master's cap. It is very fine and characteristic and may have been intended for the mason or sculptor. See Frontispiece.

FIG. 10.

In 1286, Richard de Malmesbury was employed in painting, at 2*s.* 1½*d.* per week. In 1301, the vaulting of the eastern chapels was painted with "gold, silver, azure, and other colours." (The stars and silver moons on blue still remain, although much restored.) In 1303, Thomas Plumber was paid for covering the chapel of the Blessed Virgin Mary, and other parts on the new work, and Master Walter le Verrouer was engaged in glazing the Presbytery. He was still busy in 1310, when he was receiving 3*s.* a week for himself and two boys in setting the glass.† Six lights of his great east window still remain to us, re-inserted amongst the later glass.

* See my account of the Westminster Architects, Journal of the R.I.B.A., June 1891.

* In 1299, Henry Manger, mercator of Kaim (Caen), was paid for stone. In 1304, we hear of Portlonde stone.

† The calling in of little masters with their apprentices was general. In 1299, we find a carpenter *cum garcione suo*, four days, twenty pence. We may note also here, as a custom of the carpenters' trade, that they had gloves provided for raising timber.

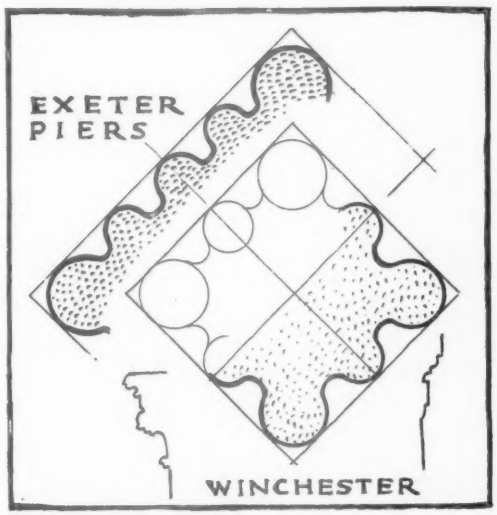


FIG. 11.—CORFE MARBLE-WORK.

In 1309, William Canon was paid "for marble from Corfe for the columns." The Canons were the great Purbeck marble contractors of the time. It is interesting to note how the mouldings of the columns at Exeter are similar to the Purbeck work of Winchester Presbytery and Wells Chapter House (see Fig. 12). The "Corfe marblers" evidently supplied their own mouldings. In this same year Master John de Glaston (carpenter or *junctor?*) moved the stalls to their situation in the new choir. The superb bishop's throne of oak is the work of Robert de Galmeston, who in 1316 received £4 for making it by piece-work (*ad tascam*); Nicholas Pictor receiving 11*s.* for *imaginibus;* the oak had been bought in 1312 for £6 12*s.* 8*d.* John, the goldsmith, in 1319, was paid for work in silver for the altar. In 1317, the choir screen, called "la pulpytte," was begun. William Canon wrought the marble-work, and the Dean and Chapter gave him £4 "of their courtesy," so pleased were they with the result.

Amongst the sums paid for the *Pulpitum*, one is mentioned in 1324 to an *Imaginator* of London, "*p. imaginibus talliand.*" The London image-makers were doubtless the finest school of sculptors in the country.

As we have seen, Bishop Stapledon must have begun the works for the nave before his death. The head mason at this time, 1325–6 (name not printed by Oliver), received 33*s.* 4*d.* a quarter; and the clerk, his co-keeper, 12*s.* 6*d.* as before. This mason we may probably look on as first architect of the nave, and an hour's search in the Roll of this year would almost assuredly give us his name. We are not left in any doubt, however, as to who was Grandisson's architect a dozen years later when (1338) the Bishop wrote to his bailiff at Chudleigh to deliver "au gardeyne de meisme loeur xii. cheynes (twelve oaks for the work) convenables pour la dite eglise . . . selon la visement Sir Thomas de Doulcote, clerk, et Maistre Thomas le Maceoun" (by the advice of our clerk and of Master Thomas the mason). This is the moment when the masonry of the nave was nearing completion. At this time we still have exactly the same dual control as was the wont forty years before. By means of this fact we can probably explain an entry of six years earlier; this is the memorandum mentioned before, in which William, Canon of Corfe then (January, 1332) reckoned for marble supplied by his father and himself for the nave (including equal to eleven and a half great columns at £10 10*s.* each, etc.), whereof the said William received payment from "Dominis John Shireford et Petro de Castro," Wardens of the said church, by the hands of the said Master Petro de Castro.

The Cathedral was no sooner finished than an amendment was made at the east end. According to Oliver, Henry de Blakeburn, a canon, gave a hundred marks for a new east window in 1389. In the Fabric Roll for this year is an entry for a skin of parchment *ad pingendum magnam fenestram.* In 1391 an agreement was made with Robert Lyen, the glazier of the church (and sworn to that office with a yearly salary of 26*s.* 8*d.*), whereby he was to receive twenty pence for each foot of new glass; and for refitting the old glass (Master Walter's) he was to receive 3*s.* 4*d.* a week, and his men 2*s.*; all new glass being supplied by the Chapter. In 1396 William Houndling and William Gervys are mentioned—the former had a salary of 26*s.* 8*d.*, I suppose, as master mason, as that was now the rate for mastership; and in him we may have the architect of the east window just inserted. Oliver, speaking generally, says, "The headmason, or overseer of the works had an additional salary of 26*s.* 8*d.*" In 1412 John Tilney, mason, was called in to inspect the ruinous chapter house, and work on it was undertaken soon after. Probably the upper storey is his work. John Harry, "freemason," was cathedral mason in 1424, at a yearly fee of 26*s.* 8*d.*, over and above his wages. In 1437 he began the new vestry for the Lady Chapel. At the same time John Budd, painter of Exeter, was working in the Cathedral, he painted the clock in 1424, and two years later he repainted "Old St. Peter," a figure which stood at the choir gate.

In 1429 Henry Glazier of Exon received payment for glazing a new window in the western tower. Many entries in the rolls use the word "tower" in a way difficult to be understood, but approximating to our "bay." Probably this payment dates the clerestory windows in the west bay where the work is clearly late.

So do these old rolls of accounts reveal to us the methods used and the persons engaged in the simple and romantic craft of building as practised in the middle age. We might define "Gothic" in five words, as the Art of many Little Masters, the "Renaissance" as the Art of a few Great Masters.

In conclusion, I wish, as a student and lover of Exeter Cathedral, to express a hope that the glass in the west window will not be sacrificed for newer fashions of stained glass. It is unobtrusive—indeed, pleasant—and is already 150 years old. It is most interesting historically. Winston supposed that the ruby glass used in it was the last made in England before the process was rediscovered in France. Its removal and the insertion of the most up-to-date plaything must injure the old stonework. As a Devonshire man I protest against the extravagance of violently destroying this window.

W. R. Lethaby.

Architectural Education.

A Review and Discussion.—I.

THE Englishman's belief in happy-go-lucky methods has lately received some rude shocks in results that were neither happy nor lucky. It is established now that battles may be lost on the playing-fields of our public schools, and that even Waterloo was not won there; that to manœuvre for a "muddle" or a "mess" in the sure and certain hope of genius punctually declaring itself to clear it up is dangerous when an empire depends upon the wager, and that a systematic neglect of system is only one kind of pedantry. The suggested remedy of entrusting our affairs to "business-men" can hardly be listened to with a grave face when we find those same business-men confessing that they are out-paced in energy and outwitted in combination by the foreigner they were accustomed to despise. The average "business man" is as hollow a person as the average "artist." It seems admitted on all hands that it may be desirable to devote to military and commercial affairs something of the study, training, and keenness that we give at present to sport. Energy and independence we have in abundance, but we are too fond of living from hand to mouth, too disdainful of systematic professional schooling.

If South Africa, Germany, and America have been teaching us these lessons in public and commercial affairs, the chaotic state of architectural design sharpens the question whether here, too, the conditions of education are not partly to blame. Art is not, to the same extent as war or business, a pursuit in which great numbers of the average man must and can be drilled to perform subordinate and half-mechanical services, and to a greater extent than these it depends on original combining and creative power. But this power, when it exists, calls for drilling in two respects. Architecture is science made art; a knowledge of the principles of construction is a first necessity of the architect, and modern architects ought to be ashamed of the fact that "engineer" and "architect" seldom mean the same person. But the decorative as well as the constructive sense calls for training. "Originality" in design is the merest weed, and must be grafted on the old stocks and pruned if any fruit is to come of it. Genius itself must learn its use and the conduct of its forces from a study of the past.

In England we maintain for architects relics of a mediæval system of training stripped of its severe sanctions. No one is forced to be a prentice before he calls himself an architect, and the amount of practical training a prentice obtains depends too much on the chances of his own industry, and his teacher's conscience or leisure. Yet there are advantages in this early practical office-training that it would be rash to imperil by hasty action. For theoretical and historical training the student must turn to one or more of those schools that have sprung up to supplement the traditional system. But unless the prentice system is relaxed, this study has to be carried on in the evenings, after hours. On the one side we have the Academy courses, which are practically confined to draughtsmanship; on the other hand, the efforts of the Architectural Association to form a school preparatory to, or concurrent with, apprenticeship. There are other courses at Kensington and at University and King's Colleges. Into the merits of all these fragments of a system it is not the business of this preliminary notice to enter. But it may be said that they do not constitute at present a complete and authoritative technical school of architecture as foreigners understand the word. The foreigners may not have said the last word of wisdom on the subject, but it is hoped that a review of the existing schools in England, and of the more systematic education of France, Germany, and America may lead to a useful discussion of the problem how far such a school or set of schools is possible and desirable in England, and of the relation this systematic education ought to bear to the office training. The moment seems to be ripe for the reorganising of teaching in all its branches; the work of the new University of London in co-ordinating individual schools is a hopeful beginning, and the clearing up of ideas and concentration of forces on the part of architects might lead to something more satisfactory than the present state of things. With a view to this we shall give accounts as full and authoritative as possible of the existing systems in different countries, and then invite discussion based upon this Blue-book survey. We begin with the country that has a very complete apparatus if it has not an art proportionate to its educational system.

GERMANY (WITH AUSTRIA AND SWITZERLAND).

By T. Bailey Saunders.

When Secretary to the Commission which reconstituted the University of London as a teaching body, it fell to me, a few years ago, to examine the relation between technical education and University studies in Germany, Austria, and Switzerland, and I thus had an opportunity, which I have since endeavoured to improve, of seeing what has been done in those countries to provide the best possible training for every kind of professional career. If a description of what has been done for the training of architects in particular be of any value or interest at the present moment to the readers of this Review, I gladly do my best to give it.

Let me begin with Berlin. There is some advantage in doing so, not only because the famous Technical High School in the suburb of Charlottenburg is the largest and, on any general estimate, must surely be accounted the best in Europe, but also because similar schools elsewhere, even if they do not accept it as their exemplar in all the details of technical education, cannot escape its influence. On its size—the main building has a frontage of some 750 ft. and a depth of some 295 ft.—on the completeness of its equipment, on the number of its halls and lecture-rooms, laboratories and museums, or on the excellence of its library, there is no need to dwell, unless for the sake of mentioning that in this respect as ample provision is made for the study of architecture as for the study of any other subject pursued within its walls. For architecture is there regarded as a subject of education quite as definite and important, and demanding just as systematic a treatment, as any other kind of special knowledge. Equally with civil engineering, mechanical engineering, naval architecture and naval engineering, chemistry and mining, and general science, it takes full rank as one of the six departments into which the school is divided, and it is actually the first of them. Attached to this department is a fine museum comprising several large rooms or galleries, in which models, drawings, paintings and various objects of art are displayed. The great attention given to architecture among the technical subjects pursued in the school seems to me, at least, to be a matter of the highest significance, because, although the opinion that it is not technical in at all the same sense in which the other subjects are so, and ought not to be studied under the same roof with them, is not unknown in Germany any more than in Great Britain, the opinion is one which finds little favour with the authorities at Berlin. The fact, too, that, according to the latest statistics, out of 4,811 students in the school during the last winter term 843 were found in this department, is fairly conclusive evidence that the authorities are not alone in their view. The curriculum laid down provides for both the scientific and the artistic aspects of architectural study, and in this as in other subjects it is very important to remember that the aim of the school is to furnish, not practical experience of actual work, but instruction in the practical application of science.

The mention of students in such large numbers may suggest a question as to their social position and previous training; and without some information on these points no one, it may be said, can form any correct idea of the part which the Technical High School at Berlin, or any other institution of the like kind, plays in the educational life of Germany. I hasten to state, therefore, that the students are drawn, to a far larger extent than has prevailed hitherto in England or in France, from all classes; and that in common with the students at most of the German Universities they are drawn in the main from the families of military or naval officers, professional men, the clergy, civil servants, schoolmasters and teachers of all kinds, bankers, merchants, shopkeepers, and farmers. The lowest age at which they can enter is seventeen, but in consequence of the thorough character of the previous training demanded few enter before the age of eighteen, and in many cases, owing to the exigencies of military service, much later still. The utmost care is taken in the department of architecture as in other departments that those only shall be admitted who are likely to make the best use of the instruction provided. To matriculate and obtain all the advantages of full studentship, a candidate must *inter alia* have passed the *Abiturienten* or leaving examination in a German classical or semi-classical or upper modern school, or have passed some other examination which, in the opinion of the Prussian Ministry of Education, is of a similar standard. In this connection it is interesting to know that, according to a recent computation, only 7 per cent. of the students in all the Prussian Technical High Schools came from secondary schools of a lower rank than those mentioned. When I was last in Berlin one of the professors told me, indeed, that half of those attending lectures in Charlottenburg came from classical schools. In addition, however, to the matriculated students there are others called *Hospitanten*, who may be men unable to satisfy these conditions of entrance, which are, in fact, severer than obtain at any English University, and who nevertheless may desire to attend some of the lectures. For them, or for others unwilling to follow a complete course of study, different arrangements are made; but in every case a

sufficient equipment in the way of previous knowledge is required. Of the 843 students in the department of architecture during the term cited 350 were *Hospitanten*—a number, be it said, out of all proportion large in comparison with those in other departments.

The instruction provided is on an elaborate scale, and as in the Universities so here, too, it is highly specialised. In the department of architecture alone there are no less than eight regular professors, ten assistant professors, and sixteen *Privatdocenten* or licensed lecturers and readers—in all thirty-four members of the teaching staff, who are directly engaged in giving instruction in one or another of the scientific or artistic aspects of this one subject. For sciences preliminary or accessory to the subject, such as mathematics, geology, and hygiene, the lectures and classes of nineteen professors and readers in other departments are available; so that a pupil in architecture, if he takes the full curriculum, can make his choice among fifty-three teachers. This choice is, in theory at least, a free one. The regulations expressly lay down that the student may determine for himself which lectures and what courses of practical work he will attend, thereby ensuring him that *Lernfreiheit* or academic freedom which is the distinguishing feature and one of the most valued advantages of German university life. He can, if he so wishes, obtain a certificate that he has attended such and such lectures, or passed such and such terminal examinations, should he desire to submit himself to this test; but the whole apparatus of compulsory curriculum, compulsory examinations during the period of study, terminal reports, and so on, which are characteristic of the English system, is not to be found at Berlin except in the case of scholars and exhibitioners. Nevertheless, for the guidance of the students, certain courses of study are recommended, and are, in fact, generally followed, although sometimes, it is true, a student will strike out a line of his own. The head of each department, moreover, is always ready to give advice to such students as ask for it, and to assist them in the choice of the lectures and practical work most suited to their individual aims. But unless this *Lernfreiheit* is borne in mind the tables which I now propose to give, showing what lines the instruction in architecture follows, may easily be misunderstood as pointing to a compulsion which does not exist.

The full course in architecture occupies four academic years, and each year is divided into a winter term beginning in October, and a summer term beginning in April. Each set of lectures is paid for separately, and, apart from the matriculation fee of £1 10s., the average annual cost to the student in fees works out at from £15 to £20. Without an ample subvention from the State—and the Prussian State is not only ready to spend money on education, but also knows how to spend it advantageously—the fees received would obviously not cover the expenses involved. Sometimes two or more lectures on the same subject, or lectures and classes for practical work, may be advertised for the same hour; but owing to the number of the teachers and the extent to which specialisation is carried, it is an arrangement under which the students gain rather than suffer. The instruction over the whole course of four years is arranged as follows* :—

THE ARCHITECTURAL CURRICULUM IN BERLIN.

FIRST YEAR.

WINTER TERM.

Monday.	*Tuesday.*	*Wednesday.*	*Thursday.*	*Friday.*	*Saturday.*
(1) Descriptive Geometry. (2) Ornamental Modelling (practical classes). (3) Ancient Art.	(1) Experimental Chemistry. (2) Figure Modelling (practical). (3) Experimental Physics. (4) Theory of Construction (two practical classes).	(1) Statics of Construction (including Mathematical principles). (2) Surveys and Measurements. (3) Ancient Architecture (practical studies in details).	(1) Experimental Chemistry. (2) Drawing of Ornaments (practical). (3) Surveys and Measurements. (4) Surveys and Measurements (practical classes).	(1) Figure Drawing from Models (practical classes). (2) Experimental Physics. (3) History of Art (Ancient, Early, Christian, Mediæval, and Early Renaissance in Italy). (4) Theory of Construction (two lectures).	(1) Descriptive Geometry. (2) Landscape Drawing in ink, pencil, carbon, and water colours (practical classes). (3) Geometry (practical classes).

SUMMER TERM.

(1) and (2) as in the winter term. (3) Early Christian and Italian Mediæval Art.	(2) and (4) as in the winter term.	As in the winter term.	(2), (3), and (4) as in the winter term.	(1) and (4) as in the winter term. (3) History of Art (Italian Renaissance and Baroque).	(1), (2), and (3) as in the winter term. (4) Surveys and Measurements (practical classes in the field).

* These and the further particulars given in this article are in each case taken from the current prospectus.

SECOND YEAR.

Winter Term.

Monday.	*Tuesday.*	*Wednesday.*	*Thursday.*	*Friday.*	*Saturday.*
(1) Ornamental Modelling. (2) Ditto (practical classes) (3) Internal Construction (practical classes) (4) Theory of Construction (higher course). (5) Ancient Art.	(1) Simple Buildings (practical classes). (2) Figure Modelling (practical classes). (3) Simple Buildings (lecture). (4) Decoration and Furniture(Ancient, Mediæval and Early Renaissance). (5) Contracts and Estimates.	(1) Working Drawings from given Sketches (practical classes.) (2) Ditto (lecture). (3) History of the Evolution of Ornament (4) Theory of Construction (higher course).	(1) History of Architecture in Western Asia and Greece. (2) Drawing of Ornaments (practical classes). (3) General Mineralogy.	(1) Figure Drawing from Models. (2) History of Architecture in Western Asia and Greece. (3) Statics of Construction (higher course). (4) Ditto (practical classes). (5) History of Art (from ancient times to the early Renaissance). (6) Foundations, bridge - building, retaining walls, planking and strutting.	(1) Plans and Drawings (practical classes). (2) Ancient Architecture (practical studies). (3) History of Architecture in Western Asia and Greece. (4) Landscape Drawing in ink, etc. (practical classes). (5) Foundations, joists, etc.

Summer Term.

(2), (3), and (4) as in the winter term. (5) Building materials. (6) Early Christian and Italian Mediæval Art.	(1), (2), and (3) as in the winter term. (4) Decoration and Furniture (Renaissance to the end of the 18th century).	(1), (2), (3), and (4) as in the winter term. (5) General Geology. (6) Practical work in Geology. (7) Architectural Technology.	(1) and (2) as in the winter term.	(1) as in the winter term. (2) History of Roman Architecture. (3) History of Art (Italian Renaissance and Rococo). (4) Principles of railway, steel, and hydraulic construction.	(1) History of Roman Architecture. (2) and (4) as in the winter term. (3) General Geology. (5) Principles of railway, steel, and hydraulic construction.

As the course progresses it will be noticed that the lectures and practical classes become more numerous and take on a still more specialised character.

THIRD YEAR.

Winter Term.

Monday.	*Tuesday.*	*Wednesday.*	*Thursday.*	*Friday.*	*Saturday.*
(1) Building in wood. (2) Drawing of Ornament in Particular Methods and Ornamental Studies (practical classes). (3) Mediæval Architecture. Designs in stone, brick, and wood (practical classes). (4) Renaissance Architecture. Designs (practical classes). (5) Select species of Ornament. (6) Ventilation and Heating. (7) Theory of Construction (higher practical course).	(1) Theory of form and construction in Mediæval Architecture. (2) Insurance against accident. Industrial Hygiene (technical part). (3) Drawing. Architectural Perspective (practical classes). (4) The chief kinds of public and private buildings. The laying out of towns. (5) Practical classes in sketching designs. (6) Ventilation and Heating.	(1) Gothic Architecture. (2) Mediæval Architecture. Designs in stone, brick, and wood (practical classes). (3) Renaissance Architecture. Designs (practical classes). (4) History of the Evolution of the leading forms of Ornament. (5) Figure sketching on specified lines. (6) Do. (practical classes). (7) Figure drawing from the life (practical classes). (8) Theory of Construction (higher course).	(1) History of Architecture in Western Asia and Greece. (2) Building in brick. (3) Building plans in detail (practical classes). (4) Plans and details in Mediæval forms with special reference to brickwork (practical classes). (5) Principles of building in iron. (6) Do. (practical classes).	(1) Building plans on specified lines (practical classes). (2) History of Architecture in Western Asia and Greece. (3) Building in brick. (4) Building plans in detail. (5) Plans and details in Mediæval forms with special reference to brickwork (practical classes). (6) Statics of construct on (third course). (7) Do. (practical classes). (8) Modelling and drawing from nature (practical classes).	(1) History of Architecture in Western Asia and Greece. (2) Insurance against accident. Industrial Hygiene. (3) Modelling and drawing from nature (practical classes). (4) Do. (lecture). (5) Rococo styles (general history of style, decoration, and industrial art).

Summer Term.

(1), (2), (3), (4), (5), and (7) as in the winter term.	(1), (3), (4), and (5) as in the winter term (2) Industrial Hygiene (social, chemical, and physiological part).	As in the winter term.	(1) History of Roman Architecture (3), (4), (5), and (6) as in the winter term.	(2) History of Roman Architecture (1), (4), (5), (6), (7), and (8) as in the winter term.	(1) History of Roman Architecture. (2) History of styles in the 19th century. (3) and (4), as in the winter term. (5) Industrial Hygiene.

FOURTH YEAR.

WINTER TERM.

Monday.	*Tuesday.*	*Wednesday.*	*Thursday.*	*Friday.*	*Saturday.*
(1) Building in wood. (2) Mediæval Architecture in stone, brick, and wood (practical classes). (3) Renaissance Architecture. Designs (practical classes). (4) Select species of Ornament. (5) Ventilation and Heating.	(1) Theory of form and construction in Mediæval Architecture. (2) Decoration in colour (practical classes) (3) The chief kinds of public and private buildings. The laying out of towns. (4) Practical classes on sketching designs. (5) Ventilation and Heating (practical classes).	(1) Gothic Architecture (2) Ornamental Designs. Extempore sketches (practical classes). (3) Mediæval Architecture in stone, brick, and wood (practical classes) (4) Figure sketching on specified lines. (5) Do. (practical classes). (6) Figure drawing from the life (practical classes).	(1) History of Architecture in Western Asia and Greece (2) Building in brick (3) Building plans in detail (practical classes) (4) Plans and details in Mediæval forms with special reference to brickwork (practical classes)	(1) Building sketches on given lines (practical classes). (2) History of Architecture in Western Asia and Greece. (3) Building in brick. (4) Plans and details in Mediæval forms with special reference to brickwork (practical classes). (5) Building plans in detail (practical classes). (6) Modelling and drawing from nature (practical classes). (7) Machinery.	(1) History of Architecture in Western Asia and Greece. (2) Machinery (practical classes). (3) Modelling and drawing from nature. (4) Do. (practical classes). (5) Rococo (general history of style, decoration and industrial art).
SUMMER TERM.					
(1), (2), (3), and (4) as in the winter term.	(1), (2), (3), and (4) as in the winter term.	As in the winter term.	(1) History of Roman Architecture. (3) and (4) as in the winter term.	(1), (4), (5), and (6) as in the winter term. (2) History of Roman Architecture.	(1) History of Roman Architecture (2) Machinery (lectures). (6) Do (practical classes). (3), (4), and (5) as in the winter term.

Such is the course of study in architecture provided at Berlin. By a recent ordinance of the Prussian Ministry of Education, those who take it are under certain conditions enabled to enter for examinations which, if passed, confer a diploma in the subject. It must, however, be clearly understood that entry for such examinations is voluntary, and that there is nothing to prevent anyone from engaging in private practice as an architect who does not take out a diploma or has not undergone the technical training provided. There are eminent architects in Germany, as there are in England, who consider that too much importance may easily be attached to technical training, and that theorists may come to regard it as usurping the place which ought to be taken by artistic insight and practical knowledge. The extreme form of this opinion is that architecture ought to be excluded from the Technical High School, on the ground that its chief factors are of the nature of Art, and that what scientific knowledge it requires is of an elementary character. This, however, as I have already mentioned, is not the general opinion, and young men who aspire to appointments in architectural firms, or to winning confidence in independent positions, as a rule undergo the technical training in full, and may possibly in some cases seek the special diploma which is now open to them to obtain.

The examinations for the diploma are two. They are conducted by a commission appointed by the Ministry of Education on the nomination of the department in question. To enter for them a student must be matriculated, and, if he is a German subject, he must possess the full leaving certificate from a German classical, semi-classical, or upper modern school—a condition which is relaxed only in the case of foreigners, who are required, however, to produce evidence of a preparatory education of a like thoroughness.

For the first examination the student must have spent at least two years in a German Technical High School or some foreign school approved for the purpose. He must also submit certain drawings certified by his teachers to have been executed by him during his course of study; or, in special cases, otherwise formally attested. These drawings must include:—

(*a*) Geometrical drawings, together with skiography and perspective as applied to details, and showing the lines of construction.

(*b*) Drawings illustrating the laws of statics.

(*c*) Drawings showing elementary construction in stone and wood.

(*d*) Freehand drawings, especially from ornaments and natural objects.

(*e*) Drawings illustrating the theoretical principles of ancient architecture.

(*f*) A survey with levels, taken by the student under the supervision of his teacher, or of a qualified surveyor, certified by one of them, and with the field books appended.

(*g*) The design for a small building of the simplest kind, with special reference to construction.

Should these drawings be approved, the student may present himself for the examination, which consists partly of set problems and partly of oral questions in the following subjects:—

(1) The leading laws of physical phenomena.

(2) The elements of inorganic chemistry.

(3) Descriptive geometry, together with projection, skiography, and perspective in their applications to architecture.

(4) Statics: (*a*) The theory of equilibrium as applied to the

determination of strains in trusses, the determination of bearing weights and cross-strains for ordinary beams, stability of walls and arches; and (*b*) the stability of beams in regard to tension, pressure, thrust, bending, and breaking.

(5) The elements of construction. The simpler forms of construction, including the most important details, but excluding iron construction.

(6) The principles of ancient architecture. The special forms and successive styles of Greek and Roman architecture.

Failure to pass in any of these subjects, or to work out the set problems satisfactorily, involves failure in the whole examination, as the principle of compensation is not recognised. The candidate is allowed only one further opportunity of making good his deficiencies.

The second examination can be taken at the earliest at the end of the fourth year, and at an interval of at least three terms from the first. Here, too, a large number of drawings must be submitted, and these must, as a rule, form part of the work done by the student in the School, and be so certified by his teacher. They must include—

(*a*) A drawing of a building in perspective, showing the shading, and of a scale large enough to show details.

(*b*) Drawings showing elementary construction in stone, wood, and iron.

(*c*) Drawings, on a large scale, of entire buildings or parts of buildings, in ancient mediæval or Renaissance times.

(*d*) Simple and diversified designs, showing a detailed acquaintance with different styles and various kinds of architecture

(*e*) Drawings and studies in ornament, coloured decoration, and natural objects.

(*f*) Original design for an entire building or for the important parts of one, showing the original sketches.

If these are approved, the candidate is asked to work out, within three months, a set task intended to exhibit his professional talents and the extent to which he has mastered his technical knowledge. If he does this satisfactorily he is admitted to the examination, which consists, as before, of problems and oral questions. The questions now range over the following subjects :—

(1) Statics of construction; analytical and graphical calculation of walls, arches, ceilings, and roofs.

(2) Theory of construction, including foundations and internal detail.

(3) Town and country houses; construction and arrangement of agricultural buildings, dwelling houses, and public offices.

(4) Ventilation and heating; hygienic, physical, and technical principles; general arrangements.

(5) Building materials.

(6) The principles of ancient and Renaissance, as also of early Christian and Mediæval architecture.

(7) The history of the foregoing styles, and of their chief periods; the general plan and construction of the more important buildings.

(8) General history of Art, with special questions in (*a*) construction, including statics, ventilation, heating, materials, etc., or in (*b*) ancient and Renaissance architecture, including theory, construction, materials, history; or in (*c*) early Christian and Mediæval architecture, including similar details.

This second examination is governed by the same conditions as the first, and failure in one subject involves failure in all. On passing it, the candidate receives his diploma, and the School is now empowered to grant him the general degree in engineering which is granted to successful students in other departments. He may then call himself, if he chooses, *Diplomirter Ingenieur*.

I ought to add, however, that this arrangement, which in the case of architectural students in the School came into operation only in October last, is, so far as they are concerned, provisional. It does not extend to a further examination, as in the case of students in other departments, whereby the degree of "Doctor of Engineering" can be obtained. My impression is that if the architectural student in Berlin wishes to have any diploma at all, he will enter for the examinations conducted by the State, which are indispensable to all who aspire to public appointments, whether in the service of the State or of the municipalities. These examinations are three in number, and the first two correspond generally to those which I have described, although, so far as I am in a position to judge, pure mathematics plays a larger part in them than is now considered necessary in the School. Four or five years ago, the course of instruction there in the first and second years comprised lectures and practical courses four times a week on higher mathematics and mechanics, but these have recently been struck out of the course at Berlin—a change which architectural educationists in this country may find instructive. As for the third of the State examinations, it can be taken only if and when the candidate has spent at least three years in practical work of an official kind. It is held by a mixed commission appointed by the Ministry of Public Works, and follows the same lines as the second, except that the oral questions refer in the main to the construction and arrangement of public buildings, and include legal and administrative problems.

The extent to which architectural education is provided in Germany, and the place assigned to it in every attempt there made to bring the highest knowledge to bear upon professional training generally, may be seen in the fact that a complete curriculum, together with examinations for a diploma in this subject, is also provided in the eight other Technical High Schools within the borders of the Empire, namely, in those at Hanover, Aix-la-Chapelle, Brunswick, Dresden, Darmstadt, Carlsruhe, Stuttgart, and Munich. A similar advantage is certain to be offered in the Technical High School now building at Breslau. These institutions are not incorrectly described as Technical Universities—*Hochschule* is, indeed, the old German word for university—and, besides Berlin, those at Hanover, Stuttgart, and Munich are already authorised to grant degrees. The curriculum in architecture which they supply,

although doubtless governed by similar aims, is not identical in plan, in regard either to the distribution of the subjects or to the time allotted to them. The difference, may, I feel, be important in the eyes of those who are preparing, or desire to prepare, educational schemes; but so far as Germany and its Technical High Schools are concerned, the space at my disposal will not allow me to do more than examine these differences very briefly in the case of one of them.

For this purpose I select the school at Munich. Although much smaller than its northern rival, both in equipment and in the number of its students, this Bavarian institution, I am told, enjoys the distinction of being regarded by a good many natives and by most foreigners as second only to that at Berlin, in the advantages which it offers for a sound and comprehensive education in architecture. This may, however, be largely due to the position which Munich occupies as one of the acknowledged homes of Art, to the Italian influence which forms so striking a feature of the city, and, in particular, to the number of fine buildings which it contains. From the atmosphere in which the school flourishes it might be expected, perhaps, to attach less importance to the scientific than to the artistic aspects of the subject, but I cannot find that such is the case. On the contrary, as will presently appear, this very atmosphere seems to produce the opposite effect, for greater attention is there given to mathematics than is given at Berlin, and students who come from classical schools are recommended to devote a preliminary year to a course in which mathematics plays a large part.

Nor are the conditions of matriculation quite the same, although they are hardly less severe. Candidates from industrial schools* in Bavaria, if sufficiently qualified, are admitted. There are also some indications of academic compulsion at Munich. A student, for instance, cannot obtain a certificate that he has attended a course of lectures unless he enters for the terminal examination held by the lecturer. The kind of curriculum in architecture provided for those who have had their previous training in semi-classical, upper modern, or industrial schools, may be seen by the following table :—

THE ARCHITECTURAL CURRICULUM AT MUNICH.

FIRST YEAR.	Winter Term. L.	Winter Term. P..	Summer Term. L.	Summer Term. PC.
Higher Mathematics, Part I.	6	3	–	–
Descriptive Geometry	4	4	4	4
Experimental Physics	6	–	4	–
General Experimental Chemistry including the elements of organic chemistry	–	–	5	–
Technical Mechanics, Part I.	–	–	4	–
Theory of Construction, Part I.	1	4	2	4
Theoretical principles of Ancient Architecture	1	4	1	6
Skiography	1	2	–	–
Drawing of Ornament	–	4	–	4
Algebraical Analysis (for those from semi-classical schools)	–	–	4	–
Practical Studies in Ancient Architecture (optional)	–	–	–	1
SECOND YEAR.				
Technical Mechanics, Part II. (Graphic Statics)	3	–	–	–
Statics of Construction	–	–	2	–
Theory of Construction, Part II.	3	6	3	6
Building Materials	3	–	2	–
General History of Art	4	–	4	–
The styles of Ancient Architecture	2	–	3	–
Principles and styles of Mediæval Architecture	2	4	2	4
Principles of Renaissance Architecture, Part I.	1	4	1	4
Perspective	1	2	1	4
Drawing from Ornaments and Figures	–	4	–	4
Studies in ancient styles (optional)	–	2	–	1
THIRD YEAR.				
Surveying	4	2	–	4
Applied Physics (Heating, Ventilation, etc.)	3	–	–	2
Architecture of Public Buildings	4	8	3	8
Farm and Agricultural Buildings	2	2	–	–
Mediæval Architecture (designs of smaller buildings)	–	4	–	4
Principles of Renaissance Architecture, Part II.	–	2	–	2
Perspective	–	2	–	–
Subterranean Construction	–	–	4	–
Drawing from Ornaments and Figures	–	4	–	4
Modelling	–	6	–	6
Practical Surveys	–	–	–	1
Practical Designs	–	–	–	2
Farm and Agricultural Buildings, Part II. (The last three optional.)	–	–	2	2
FOURTH YEAR.				
The Renaissance Style	–	–	2	–
Studies in Renaissance Architecture	–	14	–	14
Studies in Mediæval Architecture	–	4	–	4
Internal Decoration	1	4	1	4
Æsthetics	1	–	–	–
Estimates	–	–	2	–
Railway Buildings	–	–	1	–
General Machinery	3	–	–	–
Architectural Hygiene	–	–	2	–
The laws affecting Architects in Bavaria (obligatory for aspirants to Government Service)	3	–	–	–
Drawing from Ornaments and Figures	–	4	–	4
Modelling	–	6	–	6
Laying Out of Towns	1	–	1	–
Historical Development of the Farmhouse (The last two optional.)	2	2	–	–

The numbers given represent the hours devoted to each subject every week. L = lecture, P.C. = practical class.

A friend at Munich tells me that some of the older architects in that city are apt to complain of a lack of practical knowledge in those who try to exercise their profession soon after undergoing this curriculum, and that by way of partly, at least, supplying its alleged deficiences in this respect they recommend a year's apprenticeship in a good firm before beginning the curriculum at all. Others argue that the deficiences, if any, would be entirely overcome if in addition to this previous training the student were to spend his summer vacation in working in an office.

To the adoption of so rigorous a measure it may

* *I.e.*, schools in which the elements of technical education are taught to boys.

be objected, however, that even a German student requires some relaxation after several months' close attendance at lectures and classes, and that a scheme which calls for supplementary effort of this kind leaves something to be desired. Another criticism which I have heard made is that while the curriculum seems to afford sufficient opportunity to the student to develop any artistic capacities which he may possess—for example, in drawing or painting—the amount of scientific knowledge to be mastered allows him only a very short time for these exercises, and that, if the architect is to be anything of an artist, he will do well to spend a year in some special school or academy for them alone. The conclusion to be drawn from these comments is, I imagine, that the public cares little what education a man has received or what examinations he has passed, so long as he proves himself to be a good architect in actual practice.

After the full account which I have given of the examinations at Berlin I propose to be very brief about those at Munich. They are arranged on somewhat different lines. There is, first of all, an *Absolutorial* or leaving examination, open only to matriculated students who have been regular in their attendance at lectures. This can be taken in two parts, and to pass it is fair evidence that the candidate has gone through the curriculum with success. If he gets a first class in all the subjects comprising it, he may be recommended without more ado for the diploma. In other cases, however, the diploma involves a separate examination. But this *Absolutorial* examination at Munich seems to carry the ordinary student no further than a first examination for the diploma. It also provides for the submitting of drawings and the working out of problems as a necessary preliminary, and the first part deals in the main with mathematical subjects, elementary chemistry and physics, and freehand drawing. The second part is virtually the first examination for the diploma; but in view of the possibility of a student obtaining the diploma by this and the introductory examination alone, it partakes to some extent of the subjects of the final examination. The final examination at Munich resembles final examinations elsewhere, except that the attention to mathematics and mechanics characteristic of the school is kept up to the end. Since 1901 the school can also bestow the degree of Doctor of Technical Science on architectural students who submit an approved thesis and stand an oral examination. Of the two examinations conducted by the State the first is not required of those who have taken the diploma, but the second is obligatory, and no candidate can be admitted to it who has not already engaged in practice.

I now pass to Vienna. The Austrians take some pride in the fact that theirs was the first country in Europe to adopt a regular system of State-aided technical instruction and to promote the specialisation of study, although they readily admit that their efforts in this direction have, partly owing to financial considerations, been thrown into the shade by Germany. The Technical High School in the capital is in point of size, equipment, and the number of its students more comparable with the one at Munich than with the one at Berlin, and, like the Bavarian institution, it shows a tendency to prescribe a definite curriculum and make it compulsory. The *Lernfreiheit*, which is expressly stated in the statutes to be the principle underlying the instruction given exists, perhaps, only on paper; as a matter of fact courses are laid down in each department, the students are expected to take them, and examinations are held to decide the extent to which they have learned from them. That is to say, the system to which we are accustomed in England is making its way, and the specifically German system, which, in the opinion of very competent observers gives better results, is gradually being discarded. In the judgment, indeed, of one most distinguished Austrian man of science whom I consulted, the Technical High Schools in the Dual Monarchy are for this very reason, in their whole aim and character, only magnified secondary schools. There are others, I need hardly say, who dispute this view, and, now that the Technical High School in Vienna has the right to grant a doctor's degree, claim for it that it is, or soon will be, on the same intellectual level as the University. Students are admitted to it only on conditions similar to those which prevail in Germany, and the candidates from classical schools are further required, whatever department they may enter, to show a sufficient acquaintance with geometrical and freehand drawing.

The full architectural course takes four and a half years, and the instruction and the hours of work are distributed as below. This course is laid down with the approval of the Ministry of Education, and as such it apparently embraces only those subjects which are necessary for the State examinations.

THE ARCHITECTURAL CURRICULUM AT VIENNA.

First Year.	Hours a Week. Winter.	Summer
Higher Mathematics	4	4
Descriptive Geometry and Working Drawings ..	10	10
Elements of Pure Mechanics in combination with Graphic Statics (including practical work) ..	5	5
Technical Chemistry	–	3
Theory of Architectural Forms	3	–
Architectural Drawing I.	6	6
Freehand Drawing I.	4	4

	Hours a Week. Winter.	Summer.
Second Year.		
Technical Mechanics I.	4	–
General and Technical Physics	5	5
Geology, Part I.	4	–
Mechanical Technology	5	–
Construction (lectures)	5	–
Architectural Drawing II.	7½	13
Freehand Drawing II.	2	6
History of Architecture I.	2	2
Machinery	3	3
Third Year.		
Elements of Surveying	4½	–
Mechanics and Graphic Statics	7½	2
General Architecture (practical classes)	16	–
Ancient Architecture	3	3
Architectural Drawing and Studies in Composition I.	7	16
History of Architecture II.	2	2
Drawing of Ornaments I.	6	6
Modelling I.	4	4
Fourth Year.		
Early Christian and Mediæval Architecture	2	2
Drawing of Ornaments II.	6	6
Modelling II.	4	4
Architectural Drawing and Studies in Composition II.	13	8
Agricultural and Industrial Buildings, Public Offices	3	3
Studies in Composition in ditto	7	10
Engineering	6	–
Fifth Year.		
Renaissance Architecture	4	–
Architectural Drawing and Studies in Composition III	21	–
The Laws affecting Architects	2	–

Beyond this, however, attendance at lectures on political economy is also obligatory, and students can take them in their first, second, or fifth year. But the following courses are recommended as well, and they seem, indeed, to supply some obvious deficiencies in the regular curriculum:—Statics of Construction (third or fourth year), Heating and Ventilation (second or fifth), Contracting (third or fourth), Æsthetics (first or second), Building Materials (third or fourth), Pictorial Perspective (third, fourth, or fifth).

The system of examinations in the Technical High School at Vienna provides that students who wish for certificates of satisfactory attendance can obtain them by submitting to terminal examinations in the subjects in which they study. The test imposed consists of oral questions, designs worked out in the practical courses, and tasks done at home. The main examinations, however, are those ordered by the State, which are obligatory on all who desire to become civil servants, or to obtain official recognition of their capacity for private practice. The first of these examinations, in the case of architectural students, covers such subjects as higher mathematics, descriptive geometry, physics, geology, mechanics, and graphic statics; but a student who has passed the terminal tests in them with sufficient distinction is exempt. The second deals with the other subjects given in the obligatory curriculum, and the student, in addition to solving set problems and answering oral questions, may submit work done in the course of his studies at the School, and, under proper guarantees, may also submit evidence of work done outside it. Students who desire it can, after passing the two State examinations, proceed to the degree of Doctor of Technical Science on writing an approved dissertation and undergoing a further oral examination of a severe character; but this degree is taken, as a rule, only by those who wish to become academic teachers.

As to the value of the curriculum and of the diploma to be obtained by the examinations at Vienna, I cannot do better than give the readers of The Architectural Review the benefit of an opinion expressed to me by an eminent architect of that city, who is also distinguished by his practical share in the work of education. For obvious reasons he does not wish his name to be mentioned, more especially as he deals not only with the results produced by the Technical High School, but also with the position of architects who are educated in the industrial schools or in the Academy of Art. With regard to these three institutions, "the industrial schools," he says, "were originally intended in the main to provide foremen and master builders, but the more talented students from these schools have in the last decade often proceeded to the Academy of Art, and, owing to the advantages of the two-years' course there given them, have found themselves in a position to compete successfully with those who have gone through the regular curriculum at the Technical High School. These students have received a practical training which in many cases makes them more fitted for the exercise of their profession than the others, who come from the Technical High School full of theoretical knowledge, which they seldom find very useful in actual work, and therefore easily forget. The result of this is that those who have received their training in the industrial schools often prove better assistants than men with diplomas, and often succeed in competitions where the others fail. It is generally felt, indeed, that, in view of these circumstances, the curriculum at the Technical High School cannot be regarded as entirely satisfactory, and that other relations than those which now exist ought to be established between the three institutions." The bearing of these observations on some features of the problem of architectural education in England is obvious.

As German methods to some extent prevail also in the Polytechnic at Zürich, this brief description of them will be incomplete unless I refer to

that institution. Its aim, at least, is to provide instruction as good as that given in Germany; and German professors, I am told, sometimes become professors there, and *vice versâ*. Its importance may perhaps be measured by the fact that it is a Federal institution administered by a Council appointed by the Swiss Government, which furnishes it with an annual subsidy of £32,000—a sum defraying nearly 95 per cent. of its total expenses. It has also the advantage, for the purpose of this paper, of being situated, like the institutions of which I have already treated, in the same city with a university; so that its efforts are partly directed by an already existing academic influence and partly spurred by honourable rivalry. In the opinion of most of the authorities of the Polytechnic, however, it has long surpassed the local university, which is not a Federal but only a cantonal establishment.

Although the architectural department is the first of the eight into which the Polytechnic at Zürich is divided, it is not either in equipment or in the results which it achieves on a level with one or two of the others; certainly not with the chemical or mechanical departments. This, I understand, is one of the causes, and possibly also one of the effects, of the defective education and comparatively low standard of general culture which the average Swiss architect exhibits. It is true that care seems to be taken here as elsewhere that students shall not be admitted to the classes unless they have had a satisfactory previous training. They are not admitted before the age of eighteen unless they have been specially distinguished at school; nor are they relieved of a somewhat strict entrance examination unless they possess the leaving certificate from some recognised school, or have already engaged in practice with some success. But so far as I can gather from the judgment of a friend of mine in Zürich very well qualified to pronounce an opinion, the curriculum in architecture at the Polytechnic is of a dull character, and entirely lacking in the flexibility which is so distinctive a feature of the best teaching in Germany. It is obligatory in the sense that every student is, with few exceptions, bound to attend all the lectures in the course, and also to enter for the corresponding examinations, although in the last year and a half he is free to determine of what lectures and practical classes his course shall consist. One of the features of the Zürich curriculum, I may mention, is an arrangement by which private classes are held for the repetition of the substance of previous lectures. The course in architecture occupies three and a half years and is arranged as follows:—

THE ARCHITECTURAL CURRICULUM AT ZURICH.

	Hours Weekly. Winter.	Summer.
FIRST YEAR.		
Higher Mathematics	4	–
Repetition	1	–
Descriptive Geometry	2	–
Repetition	1	–
Practical Classes	4	–
Construction	3	3
Practical Classes	6	6
Architectural Drawing	6	6
Drawing of Ornaments (Models)	3	–
„ „ (Sketches)	–	4
Modelling	4	–
History of Ancient Art	4	–
„ Mediæval Art	–	4
Theory of Form (practice in Sketching)	–	2
Mechanics	–	6
Repetition	–	1
Practical Classes	–	2
Geology	–	3
Repetition	–	1
SECOND YEAR.		
Theory of Style	2	3
Composition (Practical Classes)	6	8
Construction	3	2
Practical Classes	6	6
Statics of Construction	4	–
Repetition	1	–
Theory of Building I.	2	–
Perspective	1	–
Practical Classes	2	2
Drawing from Figures (including the nude)	6	–
Drawing of Ornaments in Colour	4	–
Hygiene	2	–
Decoration	–	4
Landscape Drawing	–	4
Machinery	–	3
Practical Classes	–	2
Technology of Materials	–	3
Repetition	–	1
Construction in Iron	–	3
THIRD YEAR.		
Theory of Style (Renaissance)	2	5
Composition (Practical Classes)	6	8
Internal Construction	2	–
Theory of Building	2	–
Construction in Iron (Practical Classes)	3	–
Drawing from Figures (including the nude)	6	4
Drawing of Ornament (Sketches)	4	–
Mediæval Architecture (with Practical Classes)	–	4
Ornament and Decoration (Practical Classes)	–	4
Internal Construction (Estimates)	–	2
Public Buildings	–	2
Landscape Drawing in Water Colour	–	4
Architectural Law	–	4
FOURTH YEAR.		Winter
Theory of Style (Renaissance)		2
Composition (Practical Classes)		12
Drawing of Ornaments		4
Commercial Law		4
Repetition		1

The examinations for the diploma are two: one preparatory, taken at the end of the second year and covering the instruction in integral and differential calculus, descriptive geometry, mechanics, machinery, and the history of Art; the other, an oral test in the following subjects:—rough buildings in stone and wood, construction (including iron), hygiene (including heating, ventilation, water supply, etc.), comparative architecture and architectural history, theory of build-

ing, general law. In addition the candidate is required to produce in his last term a design for a large building on set lines.

I ought not to conclude this paper without drawing attention to a movement now on foot in Germany which has a special interest in connection with architecture. The German workman is beginning to feel that he would occupy a better position in the eyes of employers, and be more likely to succeed against undesirable competitors, if he were able to produce a certificate of efficiency, and if such a certificate were made a condition of employment. This movement, I am told, is particularly strong among the higher class of workmen engaged in the building trades. The subject recently came up for discussion in the Reichstag, when the Government announced, however, that an inquiry into the conditions prevailing in these trades had not yielded results which could as yet lead to legislative action. But the movement is hardly likely to be suppressed by this declaration, which may well have been dictated by the exigencies of the political and social situation in Germany at the present time; for the view that the workman requires to be educated quite as much as the professional man is undeniably sound. In no sphere of employment, indeed, would such training be of greater benefit to the public, and if the good architect could always be sure of finding good workmen, it would be so much the better for his art.

T. Bailey Saunders.

The Arts and Crafts Exhibition.

II.—By D. S. MacColl.

I am to reply for the critics, but I must premise that I do so as a designer who has enjoyed the hospitality of the Society and sympathised with its general aims. Anything I say is by way of pointing out how these aims may be furthered and more efficiently carried out.

With that in view, nothing, I think, is gained by Mr. Macartney's general sally against the critics, unless their attacks are met in detail and refuted. So far as my observation goes, the Society has been till now the spoiled child of criticism; what it has done has been taken at its own valuation, and the illustrated art reviews have vied with one another in reproducing what has been exhibited, and saying that it is all first-rate. If then, this year, one or two of the more thoughtful critics have sounded a warning note, there is probably reason for it, and it will not do to treat them as ignorant and spiteful assailants. It is sounder policy to recognise where the arrow has found a joint, and stop that up. The phrase I have just used recalls the fact that many joints in the Society's exhibition not only exist, but gape. Mr. Macartney says that "very few, if any, critics are equipped with the essential knowledge of workmanship as well as design." Surely a very elementary knowledge of workmanship is sufficient to judge of yawning mitreings; to recognise when the doors of cabinets will not shut, or their drawers open. And it will not do to pretend that the workmanship all round is anything to boast of, or even that there is a great deal that is out of the way of the most ordinary skill. There were, here and there, in the exhibition, examples of really remarkable craftsmanship, but the skill required in most cases for the execution of the work is nothing out of the way, and not to be compared with what is to be seen any day of the week in the shops of the so-called "commercial" firms.

The pose of "craftsmanship," then, is one in which the Society invites criticism, and even ridicule. We should recognise that skill of hand is not a very rare thing—skill of mind is; and the attitude of the amateur who is surprised at getting through an elementary piece of mechanical work without a glaring breakdown is not an edifying one. The Japanese who would perform for twopence really difficult feats of metal inlay would have a right to laugh at British gentlemen taking credit for getting a few pieces of wood nearly to meet one another, without warping to the extent of a semi-circle. Mr. Macartney knows good workmanship far too well to be deceived. In a previous exhibition, some furniture designed by him was really worth examining from that point of view; it went beyond the A B C of carpentry into some finesse. I suggest, then, as the first piece of sensible reform at the Arts and Crafts that the names of workmen should not be flourished in the catalogue, unless the workmanship is really exquisite, or requires in the workman himself some power of interpretation.

I have mentioned furniture. The extravagance or poverty of a great deal shown this year has been so fully commented on by others that I need not say anything on that head. The root of the mischief evidently was the abdication of the committee from the duty of judging one another's work. When committees come to this pass the only step that remains in that direction is to form themselves into an academy. But the Arts and Crafts Society will doubtless have the good sense to retrieve a false step. Furniture is evidently a difficulty for the single handed designer, as I have

before now pointed out. If his designs are not extravagantly "individual," he can hardly put a high enough price on the single article to pay him for his time; to make good unassertive design pay he must be a capitalist and produce things on a large scale, *i.e.*, start a shop; and the capital at least is equally required if he devotes himself to elaborate articles in costly material. Nothing is gained by obscuring this fact and complaining that "the conditions of modern life and our commercial civilisation" make it impossible to sell kitchen chairs at five pounds a piece. Much of the talk about "commercial manufacture" as opposed to Arts and Crafts manufacture is rubbish, and not very honest rubbish. The strength of William Morris's position was that he had capital as well as designing power, and ran a shop successfully. Why do artists live in jerry-built houses? Merely because artists are lazy, ill-tempered and jealous; and no two or three of them can find enough business ability and co-operative spirit to combine, build a house, and live in it. Why do they use jerry-designed furniture? Because for variations on a kitchen chair they expect the world to pay them as if for a piece of sculpture or jewellery. The fact is that at present the Arts and Crafts people have a quite unfair commercial advantage over the so-called "commercial" shop. Call a shop not a shop, but a "guild," and all the papers will publish admiring articles about its contents which otherwise would have to be paid for in the advertisement columns. Let me beg our designers then, having dropped the piece of cant about the workman, to drop this about commerce, and apply themselves to commerce frankly. In a very short time the use of the word guild for what is not a guild will cure itself. All the doubtful commerces will call themselves guilds, just as all the drabs call one another "ladies."

In the furniture business, then, and any other that requires a number of workmen and production on a large scale to pay workmen and designer, the commercial problem is a serious one, and the big shop with moderate prices is the solution. Let me return for a moment to what I have called the kitchen chair. Mr. Macartney is right enough in saying that in England, when this new movement began, things had to start *de novo*. It would be still more exact to say that we middle-class people, when we began to rub our eyes under Ruskin's preaching, had to sacrifice our "parlours" and to start from the only part of the house that had not succumbed to the art immediately preceding our own, namely, the kitchen. The new movement, very wholesome so far as it went, was to spread the kitchen over the rest of the house; for the kitchen, just on the point of becoming obsolete through the disappearance of cooks, had been overlooked by Victorian design, and there lingered in it clean walls and floors, plain wooden dressers, unteased copper and brass, and a few bits of good old furniture in disgrace. It was very difficult, however, to get things like these in the shops, and the new designers had to pay themselves for putting them on the market by adding a terrible deal of "art" to them. Hence those horrible town and village industries of repoussé (and repoussant) copper and brass; hence those other industries of wood carving which imitated the considerable abundance of bad design to be found on old oak chests and furniture. Hence the necessity, even for a Morris, of covering an honest paper or stuff with space-devouring patterns. If anything simple and satisfactory escaped and got into use it was because someone made a present of it to the world. Here is the history of one of those escapes, which I happen to know. Shortly before the first Arts and Crafts Exhibition, I think, the late James MacLaren, an architect whom many of my readers will remember, had some work to do at Ledbury, and in a walk we took one day we found, in a little Worcestershire village, a real survival of village industry, an old man who made rush-bottomed chairs, with no other apparatus than his cottage oven for bending the wood. MacLaren made him one or two drawings, improving a little upon his designs, but perfectly simple and in the old spirit, and got him to make a few chairs after these designs, which he was quite content to do at eight shillings apiece. When the Art Workers' Guild was formed, these chairs, known to some of its members, were adopted, and passed from that into many houses. Whether they are still made I do not know, but they were made without disturbing the market price, and without the designer asking anything for such work as he put into them. If a designer is to be paid on a moderately-priced article, it must be made and sold in large quantities. It will not pay the middle-class artist to make things so simple with his own hands, for we cannot pay him at his middle-class designer's rate for this elementary handicraft. He must either make himself so superlative a craftsman that he can concentrate on single, elaborate and costly pieces, or he must organise a staff of workmen who will turn out his simpler designs in sufficient number to give him a percentage on the quantity. If he puts out, say, £5 worth of time on the initial design, he cannot hope to get it back on one or two repetitions such as he could make himself; and it would be a waste of his time.

This economical difficulty does not apply equally to all the crafts. There are objects which can be made rare and precious by design and work, and can also be made by one or by a few pair of hands and fetch a price that will pay on a small quantity.

That is why jewellery has come to the front lately at the Arts and Crafts, and the same thing applies to some other crafts.

My view then of the present problem for the arts and crafts movement is that it is mainly a commercial problem. Till that is solved we shall have a superabundance of cranky amateur productions of a purely exhibition kind. If there are to be solid results it is time for the Arts and Crafts Society to start shop-keeping. To take over the exhibition idea of the nineteenth century even when the older exhibitions, like the Academy, were in decay, was perhaps unavoidable, and it may be necessary to continue it for some time to come; but the sooner this preliminary advertising stage is over, and the honest shopkeeping begins, the better. At present what happens is this. An idea receives its advertisement at the Arts and Crafts Exhibition. But it is not the inventor who usually gets the benefit of his idea. It is the shops, which straightway set their own designers or facile students from Kensington to parody anything in which there seems to be a chance of money. The really wicked competition is not "commercial" competition; it is artistic competition, the competition of the cribber with the original designer, the cribber who is prepared to make a colourable imitation of a design for a quarter of the price, since it costs him nothing in thought or time. Protection can never be perfect against this sort of thing, especially since artists often make part of their income by raising up fresh hordes of these cribbers, but there are two ways in which the evil might be checked. One is for self-respecting firms to extend their practice of going to the original designer, putting his name on their wares, and giving him a royalty. The other is for the arts and crafts group in each town to go into business and keep open all the year round a shop in which people will be able to find the ordinary useful things for house furnishing at reasonable prices as well as to commission from designers the rarer and more costly. A strong committee for selection would be required, but the thing is not impossible.

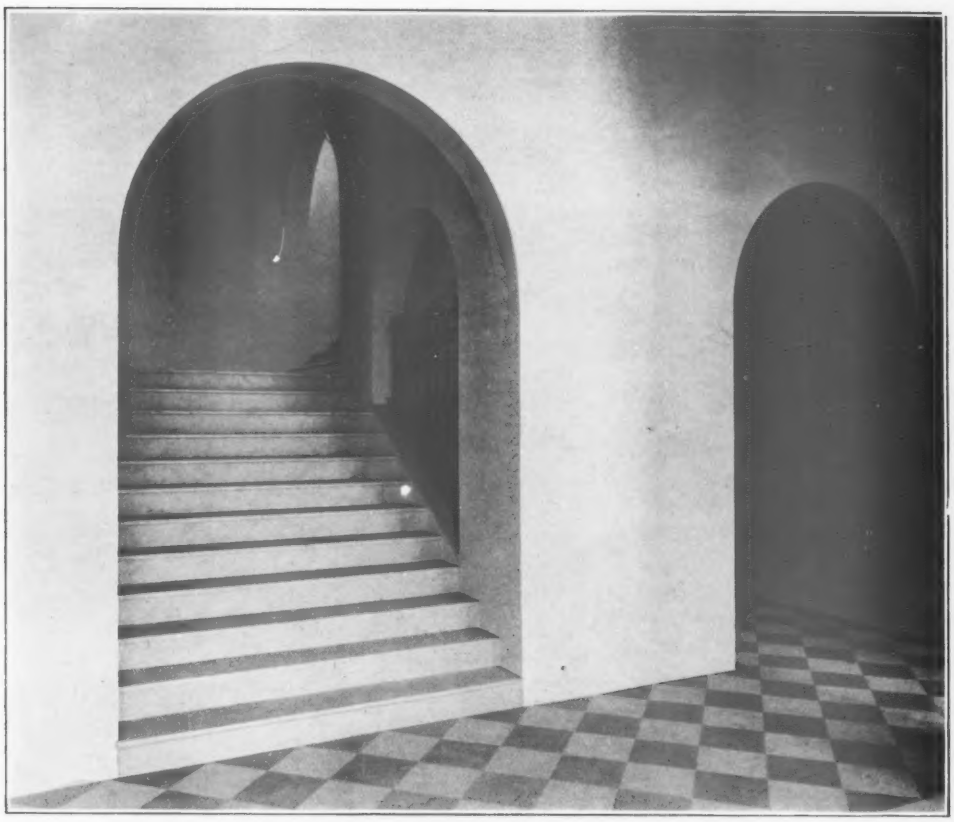
Current Architecture.

THE ROYAL SCHOOL OF ART NEEDLEWORK, SOUTH KENSINGTON.—The Royal School of Art Needlework was founded in 1872 by H.R.H. Princess Christian, and with the help of the late Lady Marion Alford, Lady Welby, and other ladies, was started in quite a small way in Sloane Street, with the double objects of reviving the almost lost art of decorative embroidery, and of giving remunerative employment to needy ladies of refinement. Since 1876 the school has been housed in some old buildings of the 1862 Exhibition at South Kensington, where, under the presidency of H.R.H. Princess Christian, who has personally worked strenuously and unremittingly in its interests, it has prospered, and has just taken up its quarters in the new building erected for it at the corner of Exhibition Road and Imperial Institute Road, and almost adjoining its old premises. As the workers of the school have frequently to deal with very large pieces of work, such as drop scenes for theatres, it is necessary that both the work-rooms and show-rooms should be spacious. The accompanying first and second floor plans give the show-rooms and principal work-rooms. There are more work-rooms on the third floor, besides kitchen and dining-rooms. The rooms in the east wing of the third floor have been leased to the School of

THE ROYAL SCHOOL OF ART NEEDLEWORK, SOUTH KENSINGTON.
F. B. WADE, ARCHITECT.

Photo: E. Dockree.

THE ROYAL SCHOOL OF ART NEEDLEWORK, SOUTH KENSINGTON. GENERAL VIEW. F. B. WADE, ARCHITECT.



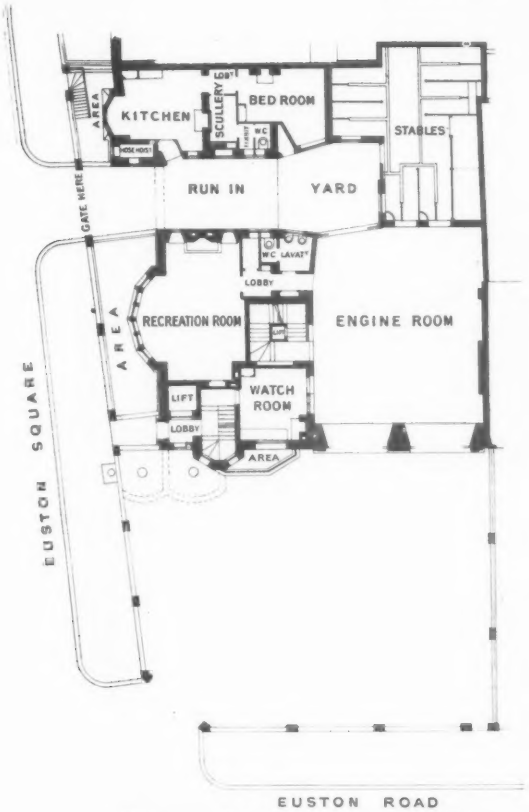
THE PRINCIPAL STAIRCASE, FIRST-FLOOR LEVEL.

THE WEST SHOW-ROOM, LOOKING NORTH. *Photos: E. Dockree.*

THE ROYAL SCHOOL OF ART NEEDLEWORK, SOUTH KENSINGTON.
F. B. WADE, ARCHITECT.

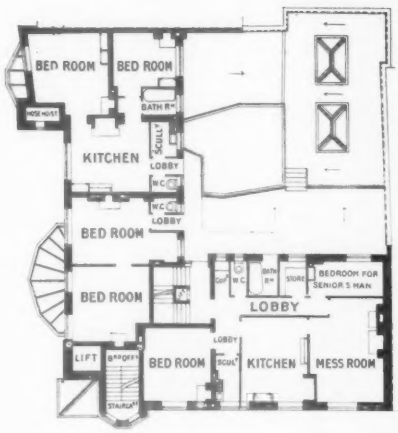
Photo : E. Dockree.

FIRE BRIGADE STATION, EUSTON ROAD, W.C. VIEW FROM EUSTON SQUARE. W. E. RILEY, SUPERINTENDING ARCHITECT, LONDON COUNTY COUNCIL.



PLAN OF SITE & GROUND FLOOR PLAN.

THIRD FLOOR PLAN.



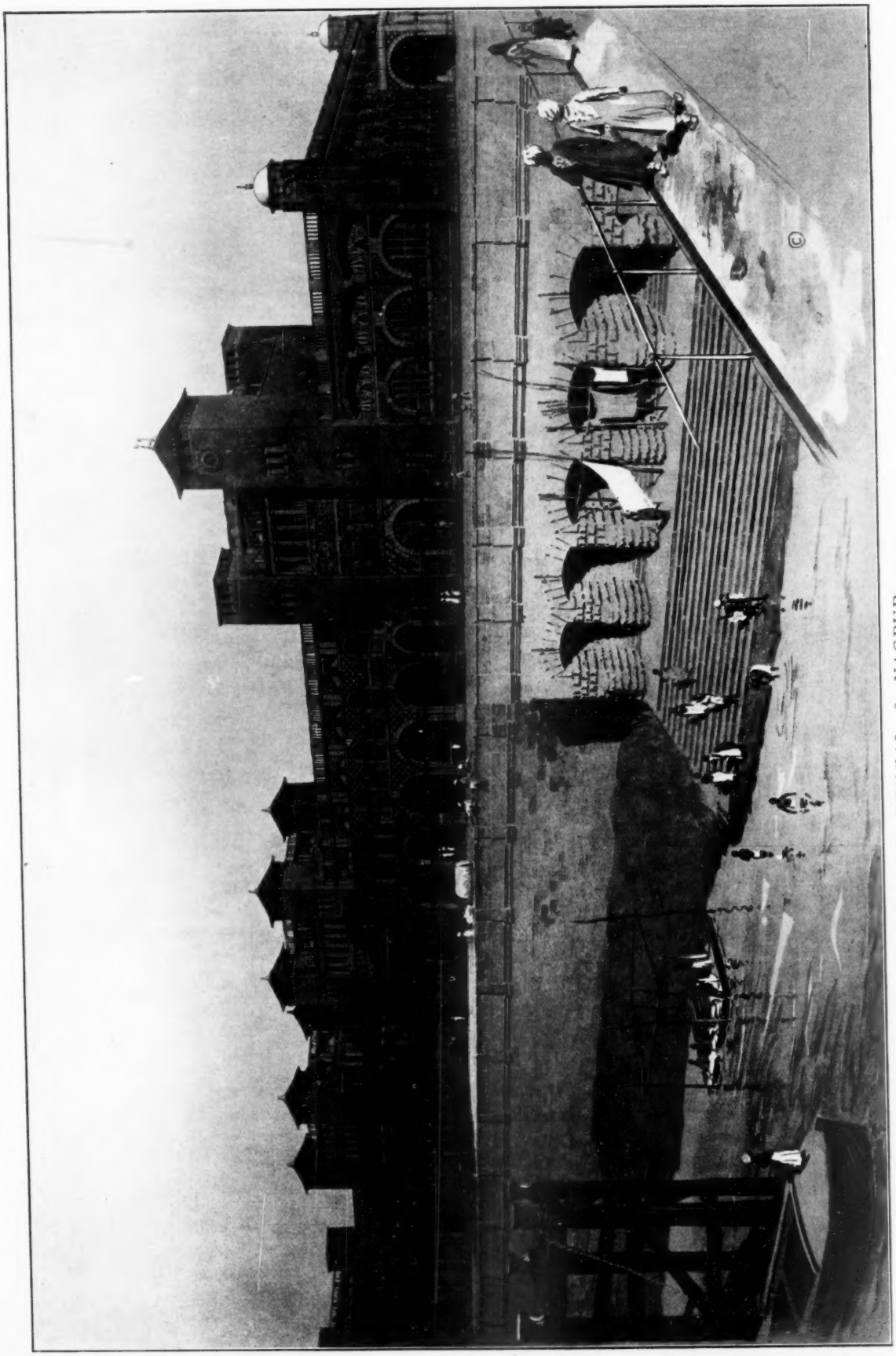
FIRST FLOOR PLAN.

FOURTH FLOOR PLAN.

FIRE BRIGADE STATION, EUSTON ROAD, W.C. PLANS.
W. E. RILEY, SUPERINTENDING ARCHITECT,
LONDON COUNTY COUNCIL.

Wood-Carving. The mezzanine floor and a large part of the basement have been leased to the Technical College. The admission of plenty of daylight to the work-rooms has been an object of the first importance, the attainment of which without architectural flimsiness has suggested the treatment of the second story. It being unnecessary to make the building lofty, breadth of treatment has been aimed at in order that it might hold its own among its greater neighbours. To this end each story is emphasised by colour contrast. Thus the roofs show green slate throughout unbroken by patches of lead-work. The second story is all Portland stone, and the walling of the show-room story is of red brickwork. The interior walls throughout are treated plainly, battens being let in for the purpose of hanging embroidery work, etc., a treatment which applies also to the principal staircase. The landings are paved with black and white marble squares, the treads and risers of Belgian white marble. The general contractors were Messrs. G. H. and A. Bywaters & Sons. Mr. F. B. Wade is the architect.

FIRE BRIGADE STATION, EUSTON ROAD.—The site has a frontage to Euston Road of about 58 feet, and to Euston Square of about 57 feet. The station is built with Portland stone facings to the height of the ground floor, and above that in red brickwork, with projecting oriel windows in



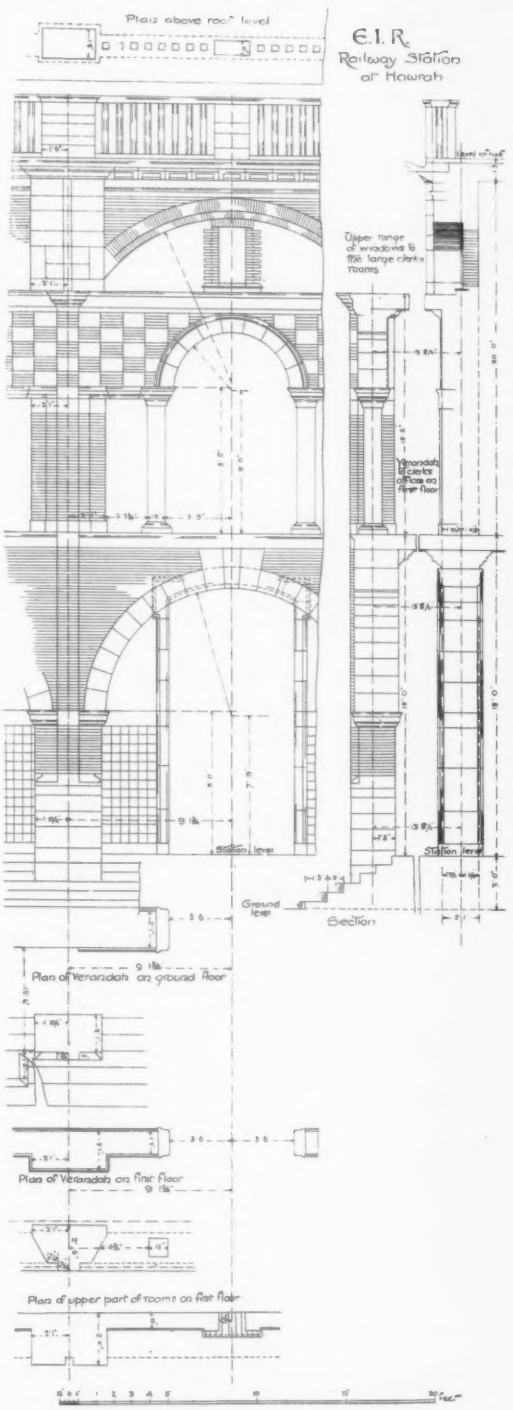
JOINT STATION OF THE EAST INDIAN AND BENGAL & NAGPUR RAILWAYS, HOWRAH, CALCUTTA. HALSEY RICARDO, ARCHITECT.

stone, and stone dressings to those windows immediately beneath the oriels. The accommodation provided on the ground floor is :—

Engine room, 39 feet by 33 feet, lined with glazed bricks, and paved with grooved stable bricks, gives standing room for horsed escape, steamer, and hose cart, ready for immediate use. The run out will be across the courtyard in front of the station of the same depth as the adjoining gardens, through a gateway at the junction of Euston Road and Euston Square (Seymour Street). The run in is on the Euston Square front through an archway into a small yard, from which the back engine room doors open. Stables for six horses in the rear of the engine room, top-lighted. Provision is made for a fodder room with loft over adjoining the stalls. The watch room is on the Euston Road front adjoining the engine room doorway, and has a floor area of about 150 feet. The recreation room has a large bay window looking on to Euston Square, and has a total floor area of about 400 feet. Adjoining is lavatory accommodation with spray bath. The third officer's private entrance is at the angle of the building, and is approached from Euston Square. It communicates directly with a lift and staircase to the third, fourth, and fifth floors, where are situated the third officer's quarters. One suite of quarters for a married coachman is also on the ground floor, and adjoins the run in.

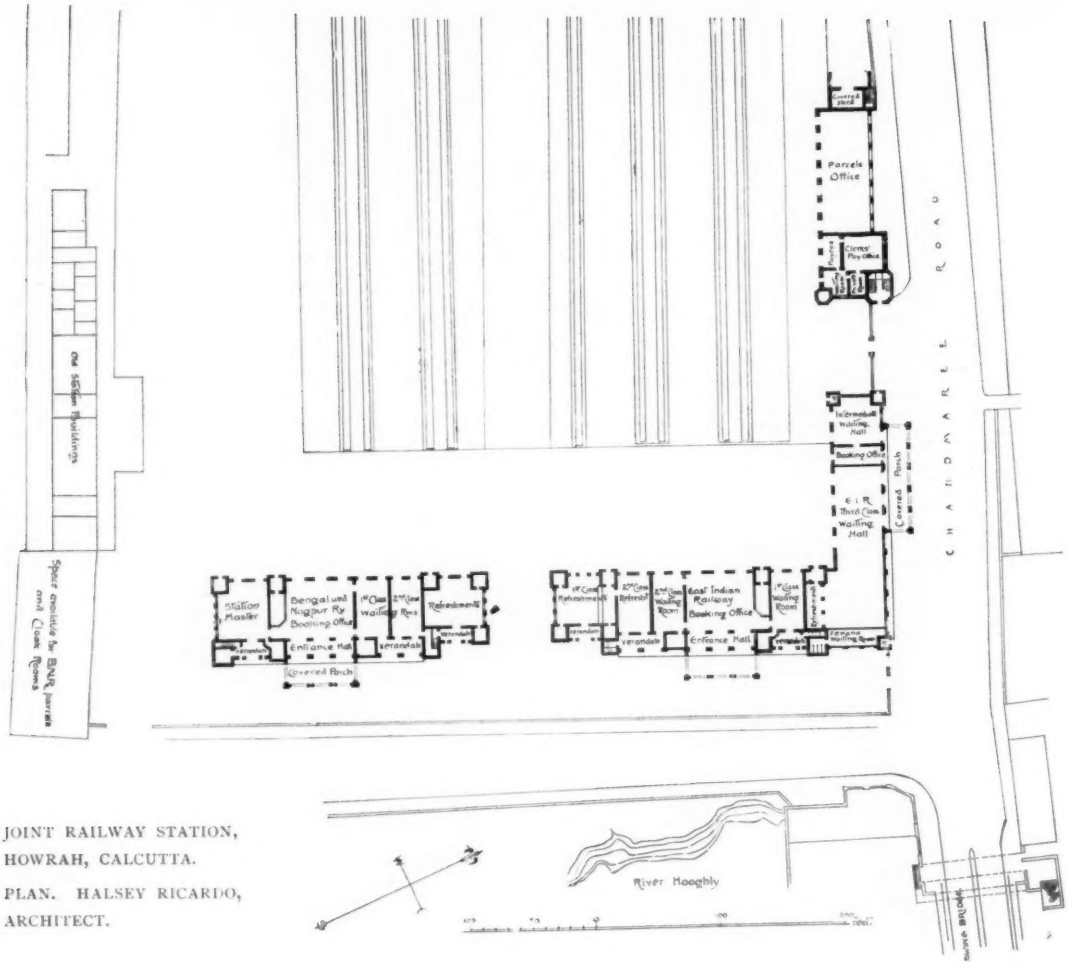
The basement extends under all the ground floor with the exception of the engine room and stables, and consists of :—Laundry fitted with six troughs, three coppers, heating chamber, and six drying horses ; battery room under stairs ; workshop ; separate storage accommodation for coal, coke, wood, and oil ; twelve coal stores for station officer and men ; three cellars for third officer's quarters.

The architect is Mr. W. E. Riley, Superintending Architect to the London County Council, and the work has been carried out by Messrs. Stimpson & Co., of 78, Brompton Road, the contract sum being £14,377.



DETAIL. JOINT RAILWAY STATION, HOWRAH, CALCUTTA. HALSEY RICARDO, ARCHITECT.

Joint Terminal Station of the East Indian and Bengal & Nagpur Railways at Howrah, Calcutta.—The traffic on the East Indian Railway having outgrown the old station, and the Bengal and Nagpur Railway requiring an entrance into Calcutta, the Directors of the East Indian decided to build a joint terminal station for the two lines. Howrah is across the water to Calcutta, to which it is joined by a bridge, and stands much in the same position as Waterloo does to Westminster, except that the river is wider. The station is being built of thin red bricks with a wide mortar joint, for the most part, stone being used only sparingly. The plan shows the arrangement on the ground floor ; the first floor is used by the District Traffic Superintendent, Traffic Manager, Telegraphs, and their clerks, and on the top floor there are residential chambers for four officials. Mr. Halsey Ricardo is the architect.



JOINT RAILWAY STATION, HOWRAH, CALCUTTA.

PLAN. HALSEY RICARDO, ARCHITECT.

The Palace at Knossos, Crete.

ALTHOUGH the first visit to Knossos was made by Dr. Evans as far back as 1894, in which year he was able to purchase a portion of the property, it was not till 1900 that he succeeded in acquiring the whole site. The excavations were commenced in March of the same year, and have been carried on since with so much energy and dispatch as to have brought to light the remains of a palace covering an area of nearly 500 feet square, almost equal in extent to that of the Houses of Parliament.

The palace was built on a slight eminence, about two-thirds (including the great central court) crowning the crest of the hill; the remaining third occupying a slightly lower site on the slope of the hill (see Fig. 1).

The great central court, measuring 200 feet by 86 feet, runs nearly north and south, and the largest portion of the palace is on its west side; portions of the eastern block are built on a level some 24 feet below the pavement of the central court.

The walls of the western side of the palace consist of a basement about eight feet in height, the floor of which is a little below the level of the central court. Those of the eastern side of the palace consist in part of two storeys, which together make up the 24 feet above referred to. The superstructure on both sides which contained the principal halls of reception probably rose to about the same height on each side. A series of terraces existed on the east side, and the lower building, which seems to have formed part of the palace, is a bastion, the walls of which are about 50 feet below the level of the central court.

In consequence of the great thickness of the walls of the basement of the western block and their close juxtaposition, the large plan which we publish is not at first very easy to read, and as a matter of fact, it probably resembles

that of the basement of most buildings from which, failing other evidence, it would be difficult to scheme out the plan of a superstructure. In the palace of Knossos, however, two other considerations have to be taken into account. Firstly, the greatest width which could be floored or even roofed over without intermediate supports was 18 feet, and there is only one hall of that dimension in the palace, that in front of the "hall of the double axes": and, secondly, the superstructure built with rubble masonry in clay mortar, framed together and bonded with timber, required foundation or basement walls of exceptional thickness. Broadly speaking, it would seem that the west wing of the palace was the public portion, including the entrance portico from the west court, "the corridor of the procession," the south terrace with its double portico, the south propylæa leading to the megaron, and the throne-room: the east wing was the private or residential portion.

There would seem to have been two principal entrances to the palace, one in the centre of the north front, the other from the south-west corner of the west court, which Dr. Evans considers to have been the agora, where the Minoan King met his subjects. It was a large open square, the western limit of which has not yet been explored, and probably responded to that feature which in French palaces is known as the "Cour d'honneur." In support of his theory Dr. Evans calls attention to the stone bench (Fig. 2) built into and forming part of the masonry of the west wall, where, sheltered in the early part of the day from the rays of the sun, the king's subjects could await his summons. A similar stone bench has been found in the palace at Phaestos, excavated by the Italians, in front of a terrace wall also on the west side. The northern entrance, Dr. Evans points out, "represents the main point of intercourse between the palace and the city on the one hand, and the port on the other. Two lines of ancient roadways in fact here converge—one leading to a region which we know to have been covered with prehistoric houses, the other pointing north in the direction of the sea, where traces exist of an ancient haven some four miles distant." This is the only part of the palace in which there is evidence of some kind of fortification, and the road of access is dominated by towers and bastions, whilst other provisions in the plan of the inner or western corridor suggest that its passage was properly protected. The slope of the ground on the east and south side (the floor of the south terrace rose from 10 to 12 feet above the ground) may have been considered a sufficient protection on those sides, and the western court was probably enclosed with a wall.

Dr. Evans' theory as to there having been "four main entrances roughly answering to the points of the compass" is not borne out by the

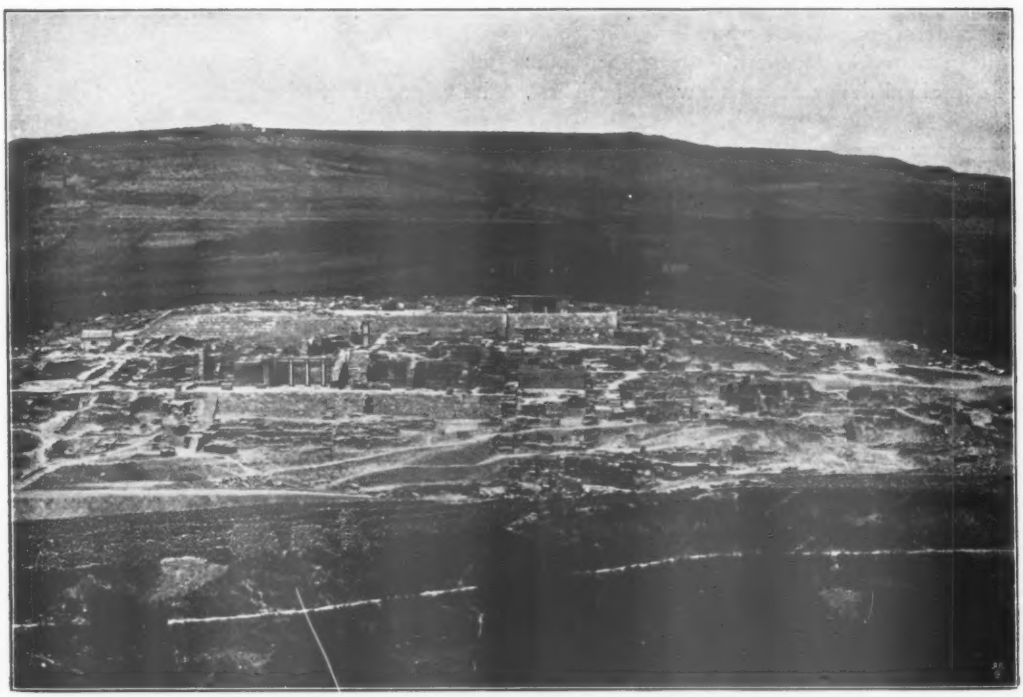


FIG. 1.—RUINS OF THE PALACE OF KNOSSOS, CRETE, AND GENERAL VIEW OF THE REMAINS ON THE EAST SLOPE.

(*By permission. From the "Annual" of the British School at Athens.*)

plan, as the north-west entrance corridor leads first to the south terrace, the propylæum in front of the great hall can only be reached from that terrace, and on the east side the entrance to the "hall of the double axes" is from a terrace to which so far no direct approach has been found (see Fig 1). Although at first sight the plan with its great central court and main entrance at the north end, and the relation of the walls all built at right angles to one another, resembles that of a Roman palace, which suggests its having been set out symmetrically or on a well-considered programme; a further study shows that it differs widely from the Roman principles of symmetry and central axes. The walls of the west front jut out into the western court at varying distances. In the central court there are projecting blocks at the north-east and south-west corners, and the entrance passage is not quite in the axis of the central court. In this respect, however, it is more in accordance with Greek principles where the work was set out on the spot to suit the site and requirements, and the entrance portico and blocks of building were placed without any regard for that symmetry which seems to have been all important to the Roman builder. The far greater picturesque grouping of the various buildings, as suggested in the plan, recalls that which we find on the acropolis at Athens, and in the sacred enclosures at Olympia, Delphi, and other shrines of Greece, rather than in the palaces of the Cæsars, or the Thermæ of Rome. It is, however, precisely this which renders a clear description all the more difficult, increased by the fact that the upper floors which contained the great halls have all perished, so that it is only by the most minute examination of the upper part of the walls remaining, that Dr. Evans has been able to suggest the probable plan. In this he has been partially assisted by the parallel afforded in the palace at Phaestos, also in Crete, which has been explored by the Italians during the last two years.

With the exception of its construction to which we shall return later on, and one hall to which the title of throne room has been given, there are no architectural features in the basement storey of the western block which it is necessary here to enter into. They consist of an endless series of storerooms and magazines which in their solid masonry and general construction were far superior to that of the ephemeral materials of which the upper floors were built. Curiously, however, it is probably owing to this latter fact that Dr. Evans' discoveries have been made; a fierce conflagration apparently burnt all the timber of the roofs and columns, and subsequent rain crumbled away all the walls* and virtually buried the palace. The inhabitants returned to plunder the palace and search for the treasures, but the stone substructures were too heavy to be moved and have consequently remained *in situ*. Had the upper part been built in stone the palace would not have been buried in the same way, and within a couple of centuries the materials would all have been taken away to use up in the erection of other buildings.

The principal state entrance was in the south-west corner of the west court through a portico of one column in antis.† This arrangement is found elsewhere here, and at Phaestos. The architect having settled the width of the portico, preferred to use one column as an intermediate support (if the span was not too great) instead of encumbering the entrance with two columns. At Phaestos the antæ or responds of the portico to the great megaron project six feet from the side walls so as to retain as it were the one column, although in the rear wall there was a central doorway beyond. In the

FIG. 2.—WESTERN COURT AND GREAT GYPSUM WALL.
(By permission. From the "Annual" of the British School at Athens.)

* These in some cases carried with them portions of the fresco painting with which they were decorated, for as it would appear from Dr. Evans' description the finest of these have been found in the basement corridors.

† The evidence of the columns lies in the stone base still *in situ* measuring 3 feet in diameter and 4 in. high: throughout the palace, all the columns were in timber and raised on stone bases.

rear on the right of the portico was the guard room, and on the left a passage 10 feet wide, called by Dr. Evans "the corridor of the procession," the walls having been decorated with paintings representing a state procession. This corridor led to a terrace 28 feet wide and 165 feet long so far as it has been traced. Dr. Evans thinks there is evidence of its further extension, which would be necessary if only to give access to the central court. This terrace, facing the south, was probably roofed over with a peristyle (Fig. 3), carried by two rows of columns which would form a sufficient protection from the sun when at its zenith. At a distance of 85 feet from the west end of the terrace is the axis of the propylæa leading to the great megaron, which seems to have consisted of a portico of one column in antis. The stone base no longer existed, but traces were found of the antæ projecting four feet from the side walls, which suggested an arrangement like that at Phaestos.* In the rear of this portico was a wall pierced with three doorways, the sill of the right hand one only existing. At a distance of 4 feet 6 inches beyond the doorways and on either side of the propylæa walls were found the bases of two other columns. The width between these walls was 30 feet, far too great a span to roof over without intermediate supports. It is probable therefore that there were three other columns and a pier on each side forming a double avenue similar to that which has been found at Phaestos, except that there, owing to the greater width across the central avenue, viz., 24 feet, the aisles only could have been roofed over. This would bring the four columns and pier in a line with the end of the walls as found. Beyond this was an open court, called the Court of the Altar by Dr. Evans, the stone base of an altar having been found in a rectangular recess on the right of the court. The level of the court of the altar is about 5 feet below that of the great megaron, portions of the upper walls of which were found by Dr. Evans. He assumes therefore that, as at Phaestos, there was a flight of stone steps (of which all traces are now gone) leading up to a portico of one column in-antis. Here the antæ measured 8 feet on the right hand side and 6 feet 6 inches on the left, and the wall in the rear had two doorways only. These led into a hall 24 feet deep and 36 feet wide, whose roof was carried by three columns down the centre.* Two doorways in the rear of the megaron opened into a cross corridor leading from the upper long gallery on the right (which rises above the corridor of the magazines), and on the left to a door giving access to a flight of eight steps descending into the central court. This flight of steps, in the centre of which was a single column, formed the approach to another long room crossing the palace, in the centre of which was found the lower portion of a wall; this may only have been a stone bench, but Dr. Evans suggests that it carried a central line of three columns. There was no necessity, structurally speaking, for them, as the hall was only 16 feet wide, and, as we have pointed out, there is a hall 18 feet in width whose roof was carried without intermediate supports. The question of the admission of light to these halls is too large a question to take up here; but Dr. Evans' proposition of a well for light on the left scarcely seems probable, in view of the fact that there is a cross wall below in the basement; the well for light would surely have been carried down to the lowest floor. The only alternative for obtaining light is that which is suggested in the great Roman Thermæ, where the halls, rising above the side passages and smaller rooms, have clerestory windows over the same. The only other rooms shown on the plan are apparently state bedrooms, which might be occupied by the king's guests if our theory as to the residential portion of the palace being in the eastern block is correct.

* In the palace at Phaestos there were no substanchions to the megaron, so that the bases, sills of doorways, and foundation of walls have all been preserved.

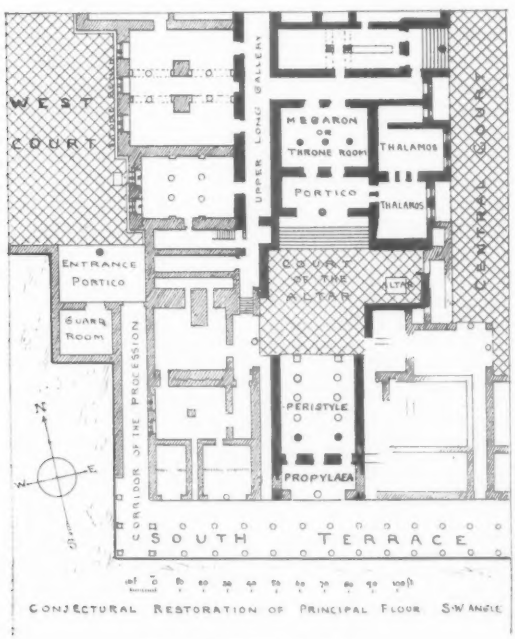


FIG. 3.—WESTERN BLOCK.

Portions blacked-in taken from Dr. Evans' restoration.
Portions hatched, taken from general plan.
Portions outlined, conjectural restoration.

* They are not quite central, perhaps to give more room for a throne in the rear. Dr. Evans points out here that the hearth as found at Tiryns and as described in the Homeric poems has not been found either here or in the palace at Phaestos.

The lower portion of the walls of the west front, about 6 feet high, are in two thicknesses of gypsum blocks, each 18 inches thick, with a core of rubble and clay between of 3 feet. They still carry in parts the remains of a superstructure in rubble masonry and clay mortar, which shows that an upper storey existed consisting either of lofty halls or of two floors with staircases of wood.

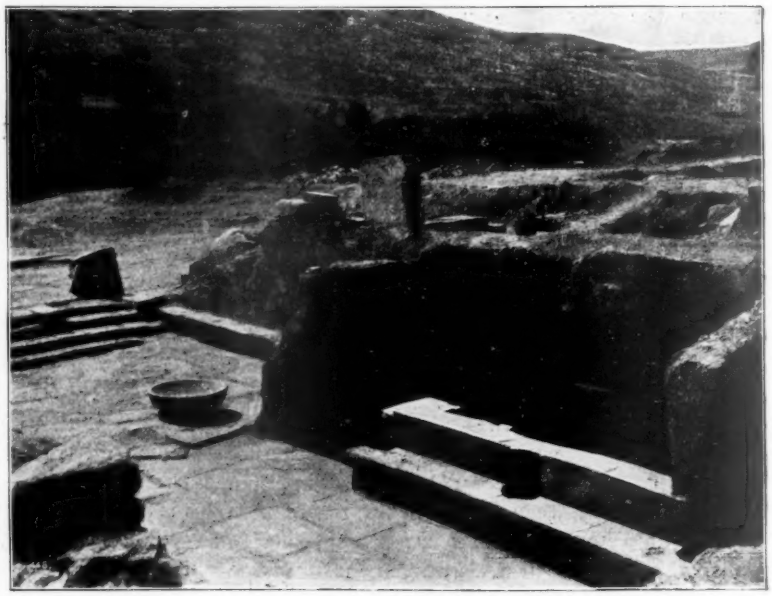


FIG. 4.—ENTRANCE TO THRONE ROOM ON LEFT. WELL-HOLE PARAPET AND BENCH, SHOWING SOCKETS FOR WOODEN COLUMNS.
(By permission. From the "Annual" of the British School at Athens.)

The only other hall which it is necessary here to describe is that which Dr. Evans calls "the throne room." This was one of the first important discoveries made in 1900. Through four doorways facing the central court one descends five steps to an ante-room, and thence through two doorways on the right to a room measuring 20 feet long by 12 feet 6 inches wide, in the centre of which, against the wall on the right hand side, was a stone seat with back to it of very original design.* On the same side of the room and returning at the end is a stone bench. The great megaron in the palace at Phaestos is called the throne room, and the much larger size of the megaron here would incline us to think that Dr. Evans' "throne room" was more probably used for cabinet councils. A room 20 feet long would not accommodate more than twelve councillors seated, with the Prime Minister presiding on his chair of state. In front of the throne (Fig. 5) is an open court or well-hole, the floor of which is sunk about 2 feet below the level of the throne room, and is approached by steps. It is not deep enough for a bath, and as there is no outlet drain for the water must have been filled and emptied by slave labour. It may, as Dr. Evans suggested, have had fish in it. This court for light was divided from the throne room by a low wall (Fig. 4) with three columns in timber, the sockets of which were sunk into a stone bench on which either the secretary or notaries of the council might have sat. Beyond the throne room was a small room in which was found a pedestal lamp showing how it was lighted.

* A cast of the same was in the Winter Exhibition of the Royal Academy.

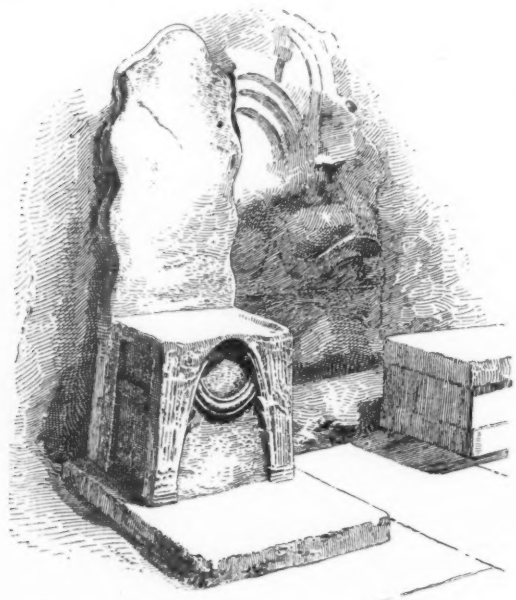


FIG. 5.—THE THRONE.

The communications between the west and east blocks of the palace have not yet been ascertained either at the south or north end of the central court. From the thickness of the walls we may assume that buildings in one or two storeys were carried across the north entrance.

R. PHENÉ SPIERS.

(To be continued.)

The Editorial Committee is indebted to the Council of The British School at Athens for the use of several illustrations.